A Mirror for Mathematiques: A Golden Gem for Geometricians: A sure safety for Sayles, and an auncient Antiquary for Astronomers and Astrologians.

(..)

Containing also an order howe to make an Astronomicall Instrument, called the Astrolab, with the vse thereof.

Also a playne and most easie instruction for erection of a figure for the 12. houses of the heauens.

A worke most profitable for all such as are students in Astronomie, & Geometrie, and generally most necessarie for all learners in the Mathematicall artes. The contents of which booke you shall find in the next page.

By *Robert Tanner* Gent. practitioner in Astrologie & Phisick.

Imprinted at London by T. C. and are to be solde by Richarde Watkins. 1587.

¶ A most excellent quadrant, hauing a distinction of the whole Worlde.

A Materiall Sphere.
A Geometricall Triangle.
Iacobs Staffe.
The Visuall shaddow.
A Geometricall rodde.

A Clock to be framed by the hand.
The passage of the night or Noctilab.
The vse of the Cylinder, both howe they may be framed and and also vsed.
Regians and Cirties subiect to the 12. signes and planets.
The proportion of measures, with necessarie rules for Captaines, Landmeaters, and Surnaiours.
Of the 12. [illegible] in the Zodiack, how they are deuided, & what degrees euerie one containeth.
How manie miles vpon the earth answereth a degree, & what nuber of miles the whole circuit of the earth containeth
Questions in Arithmatick of the Sunnes motion, hourlie, dailie, and yeerelie.
A Table of Longitudes and Latitudes, of the description of countries, cities, townes & villages, in Europe, Affrica, Asia, and America.
Also how to find out the distãces of miles between any two cities or townes mentioned in the said Tables by the elevations of the poles.
A perticuler Table of the Latitudes of the cheefest places in Spayne, and the Indies.
The names of the 32. poynts in the Shippe compasse.
A very easie rule howe to shift the Sun & the Moone.
A generall and briefe rule to knowe the disposition of the wether.
A perticuler Table of the Moueable feasts, serving for fortie & foure yeres, according to their new order in forrain nations. Necessarie for trauailers & Marchants in theyr affaires and accounts making.

To the right Honourable Charles Lord Howard of *Effingham*, Knight of the most *noble order of the Garter, Lorde Admirall of England: and one of the Lordes of her Maieſties moſt honorable priuie Counſell.*

(§)

THE Cranes when they flie out of *Cilicia*, ouer the Mountaines *Taurus*, carrie in their mouthes a peeble ſtone, leaſt by their chattering they ſhould be ceaſed vpon by the Eagles. Which birds (right Honourable) might reache me ſilence, leaſt mine ignoraunce beeing perceiued by your Honour, bewray my chattering to your noble and learned mind. The conſideration of which, draue me at firſt into doubtfulnes, whether it were beſt to write, and ſo to ſhowe my good will, or to ſuſpend my pen, and ſo to hyde the ſame. But then I cõſidered, that the ſtone *Pyrites* burneth not the fingers except it be broken: nor that the loue and

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THE Cranes when they flie out of *Cilicia*, ouer the Mountaines *Taurus*, carrie in their mouthes a peeble stone, least by their chattering they should be ceased vpon by the Eagles. Which birds (right Honourable) might reache me silence, least mine ignorance beeing perceiued by your Honour, bewray my chattering to your noble and learned mind. The consideration of which, draue me at first into doubtfulnes, whether it were best to write, and so to showe my good will, or to suspend my pen, and so to hyde the same. But then I cõsidered, that the stone *Pyrites* burneth not the fingers except it be broken: nor that the loue and

hartie affection of the minde is known e, except by words it be opened. *Iupiter* hath not made a mans body like a Lattiſe, that the hart might be ſeene through the holes, but ſhut vp the ſame cloſe, that the tongue and pen ſhould bee the organes and inſtruments of the thought.

And albeit they are many who allured by your manifold vertues, regard you, & mooued through your true nobilitie, honour you: yet as one not inferiour in affection to any, but in good wyll ſurmounting many, I boldlie preſumed (leaning to your honourable humanitie, and your ſurpaſsing affabilitie) to imprint in the face of this my rude edition, the thriſe honourable title of your noble name: As a perſonage moſt meete, and bulwarke moſt ſufficient, againſt the barking imps of the enuious, and blunt haſty boltes of the fooliſh, who becauſe their eyes be ſore, cannot behold the Sun, and their wits too weake, are not able to penetrate the ſubtiltie of Mathematicall ſciences, and therefore eyther as ſlothfull neglect them, or as malicious wholy contemne them. But the Scarab flee & lothes the ſweete flower yet loues the corrupt fleſh. The Vulture forſakes the oderiferous ointment, to ſauor the dead carkaſſe, and the ignorant rather delight in fond fancies that are fooliſh, thē in graue Sciences which are ſerious. The multitude is more delighted with a ſong, which is common and barbarous, then that which is cunning & curi-

curious. But the ſtarres runne their courſe contrarie to the world: & the learned iudge otherwiſe then the idiot. There are many, with *Sytha* had rather heare a horſe neigh, then a muſitian play, and more there are, had rather read the poemes of Poets, which are but fables, then read the Mathematiques becauſe they are curious: like to the wooers of *Penelope*, who becauſe they coulde not be fauoured of the Miſtres, ſought to bee entertained of the maide. But as God & nature, hath plentifully endued your honor with th'ornaments of the body, ſo haue they more richly ſtored you with vertues of the minde, and therfore leauing theſe Batts that by reaſon of their feeble ſight can not abide the light of the day, to flitter in the darke ignoraunce of the night. I preſent to your honor with al ſubmiſſion, the protection, and correction of my ſimple labor, who as I know your learning can iudge, ſo I hope your wiſedome will couer the errors of my haſtie heade, together with the defects of my running hand.

Rhodopes pyramis was more ſtrange thē the ſtate lie building of Princes, not for the pride thereof, but her pouerty, and my labor more to be liked, as alſo my defects couered, then the detaults of the famous, not for the tytle of skilfulnes, but the Authors ready willingnes, beeing as deſirous to profit my Countrey, as thoſe that are beſt able to performe the ſame.

The beare bringes foorth her young miſ-formed, yet by licking reformeth their ſhape, but my worke commeth out as an Abortiue, and ſo for lack of arte to fyle it muſt abide: eſpecially, for that I lack time to alter, skyll to frame, and knowledge to reduce it to a perfect ſhape, requiring your honor to eſteeme it, as it is, and fauourably to hide what ſo you finde amiſſe.

The ſmalnes peraduenture of the ſame may make it of leſſe account in the eyes of ſome, but your honor knowes, that though the pearle be but little, yet it may be of more price, then the greate Marble. And a worke though it ſeeme ſlender in ſhowe, yet may be of greater value then the large volumne. Mettals are not regarded for their quantitie, but their qualitie, nor bookes for their greatnes, but their goodnes, one dram of Gold, exceedes tenne pound of leade, and a fewe leaues, may bee better then a quier writte with great labor.

If I had any other thing to beſtowe vpon your honor, whereby to witnes my good will, which I knew you neded of, & I could ſpare it, except theſe fruites of my ſtudie, I would with all willingnes impart the ſame. But your honour knowes, the earth which yeeldeth ſalt, beareth no other thing, the Fountaine wherein glaſſe ſpringeth, produceth nothing els, & the ground that hydeth golde will beare no kind of graynes, ſo from a witt exerciſed in Letters, your honor wyll looke for no gyfts, but fruites of a wylling mind.

But

But leaſt I ſhould be tedious, I wyl conclude, remẽbring that *Protogenes* was reprooued, though otherwiſe a notable painter, becauſe hee could not plucke his penſill from the picture, and I may peraduenture be miſlyked, that can not remooue my pen from the paper, and therefore leaſt I ſhoulde ſeeme to haue entered a Laborinth without a a thredde, and beeing in can not finde the way out, I will conclude, craving your honour to receiue with cheerefulnes, to defend with willingnes, and to reade with freendlines, thys rude work, which I offer to your honor, as an outward ſigne of myne inwarde goodwill, ſo ſhall you incourage me here after, to preſent your honor with ſome worke of more importaunce. The God of heauen bleſſe and proſper in this lyfe, both you and yours, and ſende you in heauen moſt aſſured happines. Amen.

Your Honors moſt humble and daily Orator.

R. Tanner.

THE TRAVAILERS IOY AND FELICITIE.

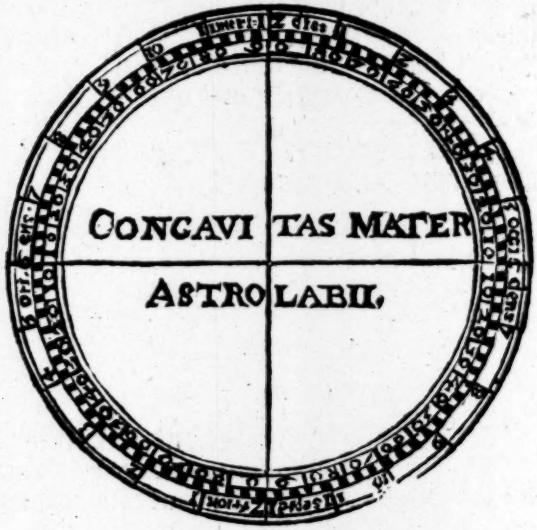
¶ The first Chapter declareth the *Composition of the Instrument called the Astrolab.*



THis present Instrument is deuided into foure partes. The first part doth containe two thinges, the first is the face or forme of the Astrolab deuided into 24. houres. After the manner of a middle Horaloge, with 360. degrées of the æquator, the lines of the diuisions béeng added with their numbers from 10. to 10. and this is termed of manie the Limb of the Astrolab. To this forme is ioyned a certaine Volowne, for the imposition of other partes or laminaries. This is called the mother of the Astrolab.

Of the which take this forme following.

MVSEVM BRITANNICVM



Holownes the mother of *the Astrolab.*

IN the seconde place commeth the backe of the Astrolab, in which the degrées of the altitudes of euerie fourth part of the circle, with their numbers from 10. to 10. vnto 90. do offer themselues. After those do followe the degrées of the Zodiack, seruing with their numbers from 10. to 10. for euery signe adding 30. to the which immediatly do cleaue ỳ names of the signes. Afterwarde the dayes of the yéere do follow

low diſtinguiſhed, with the numbers, monethes, and their names, after the order & cuſtome of the Church: betweene which, the Altimetricall Lather, for the dyuers Geometricall deuiſions hath his place: and that there might be no voide roome, in the heade and top of the Lather ſpoken of, the bowes or arcs of vnequall houres being diſcribed to ſhew themſelues.

Of this let thys Fygure folowing be taken.



The ſecond part in one Table, beeing plaine vpon one ſide, whereof are grauen the Almicantharath, that is, the circles of the progreſſions, from 6. degrees to 6. from the Horiſon vnto the Zenith of the head: and the firſt Almincarath of them, is called the Oblique Horiſon, that is to ſaie, the terminator or ender of ſight, in an Oblique Sphere, becauſe hee doth deuide the higher Hemiſphere from the lower, and whatſoeuer is vnder that circle, it is vnder the Horiſon, and whatſoeuer is aboue the ſame, it is aboue the Horiſon.

The Centrum of the inner Almincarath, is named the Zenith of the Countrey or Cittie, to the which the Table is made.

The Zenith of the Countrey or Region, is ſaid to be a prick in the Heauens, directly placed ouer the Countrey or Cittie: A Zenith doth cut betweene theſe, that is: the ſmall bowes of the Alcitudes from 15. to 15. vnto 90. paſſing thorow by the Zenith of the head, and they are vnperfect circles, which the Latines do call Verticall circles, becauſe they are aboue the Crowne, that is, they doo paſſe ouer the Zenith of heads, and do diſtinguiſh the Horiſon into 360. partes.

Afterwarde folow two lines, ſtraightlie deuiding themſelues into the Centrum of the Table, of ỹ which the firſt doth deſcende from the Ring, thorow the Centrum to the part of the Table oppoſed and ſet againſt, and it is called the line of the middle heauen, and mydle night, ſo that the hygher parte of it, which is aboue the Horiſon, is called the line of the middle Heauen, or the line of the middle daie, and the other lower parte which is vnder the Horiſō, is called ỹ Angle of ỹ earth, or middle night: The ſeconde line which deuideth the

line

line of the middle Heauen, is the ſtraight Horiſon, and belongeth to them which dwel vnder the Equinoctiall. Vnto theſe are turned in the circles of Capricorne, of the Equinoctiall, and of Cancer, all theſe thinges beeing ſæne, vnder the Horiſon ſhort bowes do offer thẽſelues framed for the declaration of vnequall howres, which beginning from the 1. in the Weſt, are ended in 12. in the Eaſt, at the laſt, thorow all the plaines, and all the circles are drawne forth ẏ bowes of the 12. houſes, deuiding one an other in that place, where the Horiſon of the Meridian lyne is ioyned. Likewiſe vnder the Horiſon of the contrarie ſide, there goeth a lyne from one extremitie & further part to the other, which doth ſhewe the firſt appearing as well of the morning as Euening, all theſe ſerue for the habitation, where the Pole of the North is eleuated 51. degrees. On the other ſide are ſæne all theſe thinges of the like ſorte, for the eleuation of 48. degrees. The third part is alſo a plaine Table, containing all thoſe thinges laſt ſpoken of, yet notwithſtanding on one ſide for 45. on the other for 42. degrees of the eleuation of the North Pole.

Behold the Fygure folowing for the eleuation of 51. degrees.



The 4. part is the Voluel ſo called, contayning the Zodiack of the 12. ſignes, with their degrées and numbers, from 10. to 10. alſo the moſt noble fixed ſtarres, very neceſſarie to thoſe which iudge of ſtarres, which is called of the *Arabians* Alencabuth, but in Latine Aranea or Rete, ſignifying a cobwebbe or net, whoſe far德eſt and extreame part béing hollow, is ſaid to bee the waie of the Sunne, or the Ecliptica. And about the beginning in the ſame Zodiack, is left a certaine little tooth, which the *Arabians* call Almuri, but in Latine a poynter out, becauſe it is that which poynteth out the degrées deſcribed in the Limb.

You

You must know that all signes with their degrées, and starres which are contained betwéene the Equinoctiall circle and the center of the Astrolab are called Septentriall, and that all which are without towarde the Circle of Capricorne, are called Meridionall.



At the last all these thinges are ioyned together, with Rules and Inderes, as followeth.

The Ruler or Voluel, which is turned in the back of the Astrolab, which Ruler is called Alhiada or mediclinium, in the which are put two little pynnes or Tables, to take the height of the Sunne in the day, and of the starres in the night, of which one side, which goeth thorow, by the Center of the Astrolab, is called ℔ lyne of trust, because it bringeth credit of thinges practised there.

Beholde the Example.



The Ring hanging is an inſtrument by which the Aſtrolab is hanged, to take the height of the Sunne on the day time, or of the ſtarres in the night, and in the Arabian tongue, it is called Alanthica, or Alphantica, or Abalhantica.

The handle or nayle which faſteneth the ring with the Aſtrolab, of the *Arabians* is called Alhabos, ſome ſay Alhabos is an hollow hole, made in ſome Aſtrolabs, in which the ring is moued.

Of this let the Figure folowing be taken.



The

The hole in the Center of the Inſtrument going thorow the nett, and all the Tables is called of the *Arabians*, Almehan.

But the Nayle entering into that hole is called an Axile trée, in the which Axile trée there is a certaine hole, which in Latine is called Stabulum, a ſtable, but of the *Arabians* Alchitot.

The Figure doth folow.



But the Nayle entering into that hole, tying the Aranea, with the little wheele, is called Alphorat, that is to ſay, an horſe.

Beholde the Example.



And ſo you haue all the explanation of our Aſtrolab. Let vs proceede further.

The second Chapter, of the finding out the motion of the Sun.

THe place of the Sunne is very fitte in all busines, if you therefore desire to haue ẏ true motion of the Sunne by the Astrolab, place ẏ side of the ruler (which is called the Lyne of trust) in the backe of the Astrolab, ouer the day purposed, in the circle of the dayes and monethes of the yeere, and by and by the degree doth appeare to the touching of the Ruler, in the Orbe of signes, called the true place of the Sun, to the Meridinal time of the day purposed, the which place, to what signe it dooth appertaine to, and of what quantitie, the signe and number in the next place, the spaces of the lynes beeing set underneath, doo make manifest. But in a yeere twyse fertile, in which Februarie hath full 29. daies, we must goe for the 29. day, to the first day of March, and for the first day of March to the seconde of the same Moneth, and so likewise vnto the end of the yeere.

The degree of the Sun beeing found in the backe of the Astrolab, marke the same in the net placed in the Zodiack. Likewise marke the degree opposed directlye to the degree of the Sunne, and they call that degree the Naidar of the Sunne. Keepe these thinges in memory, because they doo stand in steede for those that followe.

The 3. Chapter to knowe the the height of the Sunne, euery howre of the day, that is to say, by how many degrees, the center of the Sunne is eleuated from thy Horiſon.

HAng the Aſtrolab by his Ring on the thumbe of the right or left hand, that it may hang without let, and let ỳ backe of the ſame againſt the beames of the Sunne, and by a little and little heaue vppe or weigh downe the Inder, vntil you ſée the beames of the Sunne appeare thorow bothe the little holes or pinules, and when you haue ſéene this, marke diligentlie by how many degrées the Inder is eleuated, according to his right line, & it is that line, which goeth from the beginning of Aries by the Center of the Aſtrolab, by reckning in the fourth degrée of Altitude, by taking from the Diameter thoſe thinges which are tranſuerſed and turned on ſide, and the number of thoſe degrées ſhalbe the height of ỳ Sun at the inſtant of thy conſideration. An example is not neceſſary for the ſlightnes of the thing.

The 4. Chapter dooth teache to enquire out the equal houre, that is the vſuall houre of the Horaloge or Dyall.

LEarne the true degrée of the Sunne, vnto the day appointed, after the manner before declared, which degrée, marke with ſome materiall note, or note of me-

more, by the instruction going before find out ỳ height of the Sunne, which serche out, eyther before or after none, eleuate therefore the degrée of the Sunne, signed out in the Nett, by so great height betweene the Almicantharath, how great soeuer the height of the Sun is found in the back of the Astrolab, and finish this in the Orientall part of the Astrolab, if the height be antemeridinall, or in the Occidentall part, if it bee post meridinall, which beeing done, the Nette standing vnuariable, ioyne the Inder to the Sunnes degrée, and ỳ top of the same in the Circles of the hourely Limb, wyll shewe the equall houre with their fractions (if there be any) you may know that one degrée in the Limb, doth appoynt foure minutes, 15. degrées one houre, 60. minutes likewise, which is alone, as if you shall multiplie 4. minutes by 15. for in the summe you shall haue 60.

Take this example, the 30. day of March I would know the equall howre of the day, before none, therefore I loke out the place of the Sunne in the backe of the Astrolab, which I finde in the 18. degrée of Aries, afterward I take the height of the Sunne, according to the instruction aboue gyuen, which height I find to bee 41. degrées. I place therefore this sayd degrée of ỳ Sun in the Zodiack of the Nette, ouer the Almincarath, 41 in the Orientall part, and I bring the Ruler precisely vpon the degrée of the Sunne, and straight it appeareth in the limb, the ninth houre to be gone backe with 10. degrées, which degrées I multiplie by 4. and they amount to 40. Wherefore I say it to be the 9. houre and 40. mynutes past.

The

The 5. Chapter doth teach to know artificially the equall houre in the night time.

IN a cléere night, marke the height of a knowne or fixed Starre, placed in the Nette, what part of the Heauen it doth poſſeſſe, and account the ſame height, betwéene the Almicantharath in ỹ parte in which you had conſideration of the Starre, and put the head of the ſame Starre vppon the ende of the accounted height, that is to ſay, turne or wind about the Net, vntill you haue ioyned equally and euen to the terme and ende of the height, numbred the toppe of the Starre: the Nette ſtanding vnmoueable, apply the Inder to the true degrée of the Sunne, and ſtraight way you ſhall ſée the equall houre in the Margin, or Limb: which thou ſhalt finde to bee before the middle of the night, if the degrée of the Sunne ſhall bee founde before the Angle of the Earth, but contrariwiſe, if after the Angle of the Earth. The operation is like by the wandering Starres, the true place béeing taken, and the breadth of ſome planet by the Tables, or otherwiſe, which béeing ſigned in the Zodiack of the Net, do fulfill almoſt the turnes of a fixed Starre.

The 6. Chapter doth easilie teache to trye the height of Starres in the night time.

IN the Nette of the Zodiack some Starres cleauing to the Heauen, are described more cleere, which commonly we call fired Starres. It is profitable therefore to him that desireth to take the height, to loke into one of the fired Starres in the Nett, as Aldebara, Cor Leonis, or Spica, or some other appearing vpon the earth, after this manner, lift vppe the Instrument on high, placing it vpon your eye, and direct the side of it to the Starre beheld, as much as may be. Afterward, putting your eye vnder the lower little pynne of the Inder, moue it vpward and downward, vntill the sight of the eye do loke thorowe bothe the holes, therefore in beholding the Starre, consider the part, into which the lyne of the Inder falleth, and howe much it is vnder the Horison, and marke this, and the height of the Starre, cal it Meridian, or after Meridian. as before we willed of the Sunne, you may set downe an example of your selfe easily if you bee not altogether ignorant.

¶ The 7. Chapter of the rysing and setting of the Sunne.

PLace the degree of the Sunne, noted in the Nette of the day offered, vppon the first Almincarath of the East part, and the Ruler being applyed, wyll show to thee, the time of the rysing of the Sun in

in the Limb. that is to say, in what houre and minutes it is perfected: after the Nette beeing turned about, place the degrée of the Sunne to the Occidental Almicantharath, and the Inder in the touching together of equall houres, shall make manifest to thee, the time of the setting of the Sunne.

¶ The 8. Chapter doth declare the length of an Artificiall day and night.

THe degrée of the Sunne beeing put vnder, to the first Almicantharath in the Orientall part, marke diligently wyth a note the Inder ioyned to the degrée of the Sunne, in the degrées of the Limb. Afterward moue the degree of the Sunne with the Nette by the Meridian, vnto the last Occidentall Almincharath, and the Inder beeing ioyned againe, set some marke on the Limb, which done, reckon the degrées of the Limb, which haue the office of the æquator from the first marke or note, according to the motion of the Nette, and of the degrée of the Sunne into the second marke, and you shall haue the Diurnall bowe or Arce of the Sunne, which if you shall substracte from 360. degrées, the Nocturnall bow of the Sunne, shall remaine residue: these beeing had, if you desire to know the quantitie, or length of an Artificiall day, number the howres and minutes which are contayned betweén these two markes and notes, or deuide the Diurnall bowe by 15. which is the same, and thou shalt haue thy

purpose: likewise goe to worke with the bowe of the Night, if you desire to knowe the quantitie of ☽ night, take this example. I would knowe the Diurnall bowe, the 5. day of March. I find therefore the Sunne in the 24. degrée of Pisces, which degrée I place vppon the rysing Horison, and I make a marke to the place of the Ruler, in the degrées of the Limb. I do the like in the Occidentall Horison, betwéene these two markes, I gather 175. degrées of the æquator, béeing the Diurnal bowe of the Sunne of the day propounded, which if I substract from 360. degrées, I finde the Nocturnall bowe 185. degrées, also if I deuide the Diurnall by 15. I gather in the sum, the quantitie of the daie to be 11 houres, and 40. minutes, which béeing substracted from 24. dooth leaue the quantitie of the night to bee 12. houres, and 20. minutes, the matter is easie, I passe it ouer.

¶ The 9. Chapter of the rysing and falling of fixed Starres.

THe rysing and falling of fixed Starres is diuers, that is to say, of the Heauens, tempozall and Astronomicall, of which in an other place it is sufficiently handled. But héere wee will not distinguish that which pertaineth to the Heauens from tempozall, wherefoze we must speake of the rysing and falling after a larger manner. Therefoze, then is the rysing of a Starre, when it ascendeth from the lower Hemisphere to the higher, which happeneth to a Starre once in a naturall day, the falling of it is, when it descendeth from

from the higher Hemiſphere to the lower: wherefore you muſt vnderſtand the houre, or part of the howre of the Sunne, in which the Starres do ſteadfaſtly ryſe and fall, alſo the time of the ryſing and falling is ſomewhat diuers, according to the alteration of the Sunne thorow the ſignes of the Zodiack: There is an other ryſing and falling of a Starre, not referred to the Sun but to the Starre it ſelfe, as when at other times wee made mention of the houre of the Starre, and not of the Sunne, imagine therefore, a ſtarre to ſtand in ſtead of the Sunne, then if you ſhall ioyne the Starre to the Orientall Horiſon, and ſhall bring the Inder by it, you ſhall learne ſtraight in the margine at the place of the Inder, the ryſing of the Starre, and if you ioyne it then to the Occidentall Horiſon, you ſhall knowe the fall. But they which inhabit the Septentrio, haue ſome Starres neuer ryſing or faling, which of neceſſitie doo appeare at all houres, (but the light of the Sun dooth hinder it) as all the Starres are to them which inhabit the ſeauenth Clymat of the leſſer Arck, and they principall Starres of the greater Arck, of Draco, Chephei, Caſſopeia, ſome Starres of Cignus, Perſeus, and of Auriga. For all the Starres of the Aranea of our Inſtrument, which do not touch the Horiſon in his turning about, do neither ryſe or fall, but do continuallie appeare. Other Starres riſe and fall, as are the ſignifying Starres, and manie other, for what Stars ſoeuer of the Aranea, are kept vnder the Horiſon, wee conclude iuſtly, that they fall and riſe, to which our propoſition ſhall be applied after this manner, frame the Starre purpoſed in the Nette, for the day offered, in the ryſing Horiſon, and drawe the Inder by the degree of the Sunne of the daie offered, the ſame time in the meeting and touching together of the Limb, will make

manifeſt the ryſing of the Starres in the houres and minutes, which ſtarre, being put ouer to the Occidentall Horiſon, the Inder cleaning to the Sunnes degrée, will open his falling. But whether ſuch ryſing or falling may be done in the night or day time, that is eaſie to be known, eſpecially, if you haue learned thoſe thinges well, which we haue taught you before, about the ryſing and ſetting of the Sunne, and the finding out of the howres of the day and night: wherefore I ouerpaſſe it wittingly. In like ſort you ſhall finde the time of the ryſing and faling of wandering ſtarres, when you ſhall marke the places of them to bee equall in length and breadth.

¶ The 10. Chapter of the finding out of vnequall and planeticall houres.

You ſhall know the vnequall howre of the day by this ſhort Rule, if you ſhall ſearche out the equall howre, by the Inſtruction aboue giuen, which being found, the degrée being oppoſed to the degrée of the Sunne, (which the Aſtronomers call Nadair) ſtraight in the roomes or places of vnequall howres, dooth declare the planeticall howre, that is to ſay, the 1. 2. 3. 4. and 5. antemeridian: the 6. meridian, but the 7. and 8. 9. 10. 11. 12. poſtmeridian: according as thou haſt obſerued the equall houre before or after none. And if the Nadair of the Sun ſhal fall into the lyne of howres, ſay the howre to bee ended according to the aſcription of the numbers, and the howre

howre folowing to beginne. But if the Nadair shal fal vpon the space which is betweene the two lines, ỹ lyne going before doth declare the houre to be ended, but the lyne folowing doth declare ỹ houre going onward, and to be vnperfect. But if you desire to know the vnequal howre of the night, learne first the equall howre, and the Nette standing with his Inder in the bowes of vnequall howres, the degrée of the Sunne doth declare vnto thée the vnequall howre: and these howres beginning in the West, do fall in the rysing of the Sunne. The matter is plaine, it néedeth no example. By thys manner you shall finde out the vnequall howres, in the backe of the Astrolab. The little bowes of the howres vnequall, are framed in the backe, ouer the Lather of measure of height. Therefore learne the Meridian height of the Sunne, to the day propounded, which béeing founde, in the touching of the lyne of the 6. howre sette a marke on the Inder, and you shall kéepe thys marke two or thrée daies if you please, because in that while, it will not be greatly altered. Last of all, the sun shyning, take the height of it before or after noone, and the mark of ỹ Inder spoken of, the same height standing still, doth shewe the vnequall howre to thée, concerning the dominion of the Planets in vnequall howres. I let it passe, because the matter is commonly knowen euery where.

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¶ The 11. Chapter doth teache to number the declining of fixed ſtars and of euery degree of Ecliptick.

PLace the Starre, Sunne, or degrée of the *Zodiack*, whoſe declyning you deſire to knowe, vpon the lyne of the Meridian of the Inſtrumẽt, and marke how many degrées it is eleuated from the Horiſon betwéene the Almincarath, and kéepe the number. After, put the firſt lyne of Aries or Libra vpon the ſame meridian lyne, and likewyſe marke the height thereof from the Horiſon, betwéene the Almincarath, and kéepe the number: take the leſſer number from the greater, and that which remaineth, ſhall bee the declyning of the Starre propounded, of the Sunne, or of the degrée of the *Zodiack*, and it ſhall bee Septentrionall, if the height of the ſtarre, or Sunne, &c. ſo forth, ſhall be greater then the height of Aries or Libra, but if contrarie, it ſhall bee Meridionall.

An Example.

The Sunne is offered to me poſſeſſing the 28. degrée of Aries, I am wylled to number the declination of the Sunne, and I place the 28. degrée of Aries vpon the Meridian lyne, and ſée the Meridian height to bee 52. degrées, which I kéepe. Likewyſe I place the beginning of Aries vpon the ſame lyne, and I finde the heyght to be 41. degrées, and almoſt 20. minuts, which

also I kepte. I take away ỳ second height, because it is lesser then the first, & there remayneth 10. degrées and 40. minutes, béeing the declyning of the Sunne and Septentriall, by reason that the height of the Sunne is greater then the height of Aries.

¶ The 12. Chapter doth teache by what way you must serche out, in what Clymat any one is which straieth in the Sea, or wildernes.



IN the day time we take the Meridian height of the Sunne, after the manner before erpressed, likewyse we shall learne by the way folowing, the eleuation of Aries or Libra, that is, of the æquator, and last of all, the breadth of the place vnknowne in which we liue, wée shall finde out the same breadth in the Tables of the Clymats vnder written, and straight it appeareth in what Clymat, beginning, middle, or ending of the same, in the night time we shal finish the same by some fixed starre, placed in the Aranea of the Astrolab rysing and falling, by the office of the Astrolab, wee obserue the height Meridian of a knowne starre appearing ouer the Horison: which had, we finde out the e-

leuation of Aries, or Libra, and at last, the breadth of the place considered, by which, with the helpe of ỳ Table of the Clymats we shal worke, as we haue spoken, and we shall haue our account, by example you shall receiue it more certaine.

Marke the Meridian height of Spicæ Virginis, which I finde to be 40. degrées, likewyse I looke out the eleuation of Aries, or the æquator, which I finde to be 54. degrées and 16. minutes. Further, I looke out the breadth of the place considered, vnknowne, and find it to be 35. degrées. 44. minutes, which breadth founde in the Tables of the Clymats, I doo say the place vnknowne considered in this manner, to bee contayned betweene the beginning and middle of the fourth Clymat, which thyng was desired for.

¶ The Ta-

THE TABLE OF
THE CLIMATS.

51	The degree of breadth.		degree of breadth.		degree of breadth.		degree of breadth.		degree of breadth.	
50	the end 7.	40	the beginning.	5.	30 the middle.3		20	the ende.1.		10
49		39	the ende.	4.	29		19			9
48	the middle 7.	38			28 the begin.3.		18			8
47	the begin.7.	37			27 the begin.3.		17	the ende.2.		7
46	the ende.6.	36	the middle.	4.	26		16	the middle.1.		6
45	the middle.6	35			25		15			5
44	the begin.6	34	the beginning.	4.	24 the middle.2.		14			4
43	the ende.5.	33	the ende.	3.	23		13	the begin.1.		3
42	the middle.5.	32			22		12	of the Climat.		2
41		31			21 the begin.2.		11			1
					The æquator.					

and felicitie, fol.16.

The 13. Chapter of taking the height of some Place, Region, or Towne.

LEarne the Meridian altitude of the Sunne, and if the Sunne in the Meridian time shall come to the beginning of Aries or Libra. (which rarely happeneth) the meridian height doth showe the eleuation of the beginning of Aries or Libra, vpon the Horison, by the following of the æquator or ỹ circle, which height beeing substracted from 90. degrees, doth leaue ỹ breadth of the Cittie. But if the Sunne shall be found in some Septentriall signe: know his Septentriall declyning by the rule going before, which take from the meridian height of the Sunne, and the eleuation of Aries or Lybra, and of the æquator will be manifest, (which as wee haue admonished) beeing taken from 90. degrees, doth minister the breadth of the Region, or the eleuation of the Pole. But if the Sunne goe by the meridian signe, add his Meridian declining beeing found out to ỹ height of the meridian, and the eleuation wyll appeare of Aries or Libra, which beeing taken from 90. degrees dooth finish thy purpose. But in the night time, you may after this manner obtaine the like, by some fixed Starre which ryseth and falleth, which is knowne to thee, mark the meridian height thereof, also the Septentriall declyning, or Southerlie, as thy busines requireth, which being had, thou shalt goe to worke, as wee haue declared aboue concerning the Sunne.

The

¶ The 14. Chapter doth teach to knowe, to what Climat, Region, or Towne the mother of the Astrolab is framed.

YF you doubt to what breadth, or Pole eleuatiō of Climat region, or Towne, the mother, or some Table placed in the Astrolab is made: account the degrées in the meridian lyne, and the minutes if there be any, in the Almincharath, from the æquinoctiall cirkle, vnto the Zeneth of the head and the number of Almincharath dooth showe the breadth, which knowne, you shal easily be brought to the knowledge of the Climat, Region, or Towne.

¶ The 15. Chapter doth declare the degree of the Ecliptick, with the which the Starre described in the Nette doth rise and fall.

FIrst ioyne the toppe of the Starre offered to the rysing Horison, and straight in the Ecliptick line the degrée wil appeare with which the Starre doth arise. The which degrée, of what signe it is, & what quantitie, you shall easily learne by the ascriptions of the name and number. Further, apply the head of the Starre to the compassed Nette, in the falling Horison, and againe you shal sée the degrée in the Ecliptick, with

which the Starre doth slyde and fall, the name of the signe, and the quantitie of degrées béeing added. I suppose examples are not necessarie, the thing is so easie, by the same rule, you shall searche out, with what degree of the Eclipticke ante Starre doth goe in the midst of Heauen, you shall easilie finde, if you ioyne the toppe thereof to the meridian lyne.

The 16. Chapter dooth profitably searche out the Zenith of the rysing and setting of the Sunne and of fixed Starres.

When you desire to knowe the Zenith of the rysing and setting of the Sunne, or some other fixed starre, sette the degree of the Sunne, or the toppe of the starre vpon the rysing Horison, and at ỳ place of the degrée of the Sunne, or top of the starre, sette some marke on the Horison. After by the helpe of their Azenith, account the degrées of the Horison contained betwéene the East, that is, the Equinoction, and the marke made, and the number of the degrées which endeth in the marke, wyll open to thee the Zenith of the rysing of the Sunne or starre, that is to say, the distaunce of the rysing of it, from the rysing of Aries or Libra, and such a Zenith of rysing is sayd to be meridionall, if it shall be found in the fourth, first, or Septentriall, if it be found in the fourth: and vpon the like number of degrées of Azenith, shalbe the Zenith of setting, and also in the like fourth, whether Septentriall or meridian.

The

The 17. Chapter, of finding out the Zenith of the Sunne, and fixed Starres.

SO you shall find the Zenith of ☉ Sun, that is to say, the distaunce of the Center, from ☉ beginning of some fourth part, at the houre appointed by ☉ office of the Astrolab, marke the height of the Sunne, then the degrée of ☉ Sun must be put into the Mette, vpō the like number of the height obserued in the Almincarath, in the same part in which the Sunne was, as you accustomed to dō in finding of the houres, and the Azenith, vppon which the degrée of the Sunne shall fall, doth shew to thée the Zenith of the Sunne, that is to say, his distaunce from the beginning of some fourth part, if it be distaunt at least, and it must nédes bee that such a Zenith bee in some fourth part Meridian, Orientall, or some Septentriall Occidentall: you must deale so with fixed Starrs, placed in the Mette. But if the Center of the Sunne, or the toppe of the Starre shall happen in the distaunce of 2. Azenith: deale for the knowing the degrée of distaunce, eyther by estimation, as we often dō, or by deuision of the space into 10. degrées, as you haue learned by the rules going before.

The 18. Chapter doth teache, how one fixed Starre beeing knowne of the Aranea, the knowledge of other vnknowne, is to be enquired.

IF some fixed Starre placed in the Aranea shall be knowne to thee, by the same thou shalt know any other vnknowne to thée described in the Aranea after thys maner. In a cléere night, marke ỳ height of the starre knowne to thee, then put the toppe of it vpon the height marked betwéene the Almincarath, by accounting from the East or West, according as you shall sée it placed in the firmament, which done. Sée straight the starre vnknowne, placed in the Nette, and consider his height betwéene the Almincarath, & marke in what part of the worlde it shall fall, place the Inder vpon the equall Altitude, in the backe of the Astrolab, and turne thée to that part of the world, into which the vnknowne starre did fall, and the greatest and cléerest starre which you shall sée thorow the holes of the Tables, is the same which you séeke for. The matter is plaine, it néedeth no example.

¶ The 19. Chapter doth teach to come artificially to the knowledge of the Stars of the eight Orb, being vnknown.

WHat can be more pleasaunt, or delightfull to our eyes, then the order and viewe of those so manie great

lights, moſt ſéemely and comely, for if wee bee drawne thether by deſire, we ſhall trye, we haue felt nothing more delectable in this life. Wherefore if you haue knowledge of no fixed ſtarre, and you ſhall wyſhe to haue knowledge of them in the heauen, goe to worke after this manner. Marke the houre of the night by ſome Clock well corrected, to the which howre, apply the degrée of the Sunne in the Nette: which done, looke what ſtarre ſhall fall vpon the ryſing Horiſon, ỳ ſtarre, whoſe knowledge you did ſéeke for, doth ariſe at ỳ time, and what ſtarre ſhal fall vpon ỳ riſing Horiſon, it doth fall then. And that you may perceiue the matter more plainelie, conſider in what houre of the night, the ſtarre which you ſéeke to know, doth come to the Orientall Horiſon, further marke the Zenith of the ryſing of the ſtarre, and the number betwéene the Azimuth and the fourth part, in which the ſtarre doth riſe, which had, put the Aſtrolab according to the 4. partes of ỳ world, and apply the Inder to the degrée of the ryſing in that fourth part in which you haue found the ſtarre, & when you iudge the time of the ryſing of the ſtarre to bee at hand, looke thorowe the holes of the Tables, and the beames of the ſtarre aryſing, falling vppon thy eye thorowe the holes of the Tables, wyll ſhowe the knowledge of the Starre propounded. The like operation is of the falling of the Starre, and eaſier, whē as you ſhall bring it to apply it ſelfe to the holes of the Tables, ſtaying vpon the Horiſon, and about to fall, whereby hys knowledge ſhall be eaſier gotten: therefore the knowledge of ſome ſtarres béeing had by the manner of thys inſtruction, you ſhall be brought by a little and a little, by the doctrine ſpoken, into the knowledge of all the ſtarres deſcribed in the Nette, and in theſe, practiſe wil make thee a cunning workman.

¶ The 20. Chapter of numbring the aſcention or deſcention, in a right Sphere of one ſigne of the Zodiack or more.

IF therefore you deſire onely to know the aſcention of one ſigne in a direct Circle, ſette the beginning of the ſigne on the line of the right Horiſon, in the Orientall part, and the Inder beeing put to, make a marke in the degrées of the Limb: then moue the Nette: ſo that the Inder may fitmely cleaue to the beginning of the ſigne, vntill the ende of the ſigne fal on the ſame line of the right Horiſon, and againe at the breall as it were of the Inder, make a marke in the degrées of the Limb, then reckon the degrées, which are contained betweene the two markes: for ſo manie degrées, as you gathered by account, do aſcend from the æquator, with ſuch a ſigne in the right Horiſon, which degrées, are named the aſcention or riſing therof, which if you ſhall deuide by 15. houres, you ſhall multiply the reſidue by 4. You ſhall ſerche out the minutes of the houre, and you ſhall haue the houres and minutes in which the ſignes propounded do riſe in ỹ right Sphere. In the like manner you ſhall ſeeke out the aſcention of 2. 3. or more ſignes &c. The deſcention of a ſigne or ſignes, or portions of the Zodiacke in a right Circle, is like the aſcention: wherefore it is not needefull to deliuer it by the way, how ſuch a diſcention may be reckned.

The

The 21. Chapter of the right aſcention of a degree of the Ecliptick of a Starre.

AND if you would know the aſcentions of ſome degrée of the Ecliptick, or Zodiack, or ſome ſtarre, place the degrée or toppe of the ſtarre vpon the right Horiſon, ryſing, and the Inder beeing ioyned to it, ſtraight you ſhall behold a right aſcention in the æquator, anſwering to this degrée propounded, or ſtarre, which aſcention is to be reckoned from the Vernall diuiſion, that is to ſay, from the beginning of Aries. But if at laſt you deſire to number in the degrées of ♈ Limb, goe to worke as we haue appointed, moue the Inder to the vernall diuiſion, by ſetting a mark on ♈ degrées of ♈ Limb, after account ♈ degrées of ♈ right lyne of the Horiſon, vnto the marke made, and you ſhal haue your deſire. Moreouer, the aſcention right, of the degrée, and the deſcention of the ſtarre is, as it is manifeſt aboue.

¶ The 22. Chapter, howe by the right aſcention knowne of a ſtarre, the bowe of the Ecliptick aſcending with it, may be found.

THe Nette therefore ſtanding vnuariablie, for the right aſcention of a ſtarre, as it was declared, reckon the ſignes and degrées of the Zodiack, beginning from Aries, vnto the right Horiſon ryſing, for theſe ſignes, and theſe degrées,

so many as you doo gather in number, doo make manifest the bowe of the Ecliptick ascending together.

¶ The 23. Chapter, dooth deliuer in fewe words, what signes doo ryse and fall rightly, and what signes doo ryse and fall crookedly in a right Sphere.

EXperience beeing had, by the doctrine going before, of the rising and falling of seuerall signes, you shall finde Aries, Taurus, Leo, Virgo, Libra, Scorpio, Aquarius, and Pisces, in a direct Circle to arise and descend crookedly, for the portion of the æquator of euery signe ascending and descending together, examined by it selfe, is lesse then 30. degrées. You shall affirme that Gemini, Cancer, Sagittarius, and Capricornus, to rise and fall rightly, because the portion of the æquator, answering to the rising and falling of thē, is greater then 30. degrées. For you shall gather by diligent examination, that signes opposed, and set against, haue equall ascentions and descentions.

¶ The 24. Chapter doth teach, to comprehend in fewe wordes, what signes do ryse rightly, in a crooked and oblique Sphere and what signes do arise and fall crookedly.

BY the doctrine proceeding, marke the ascentions or rysings, and descentions, or fallinges of euerie signe, by

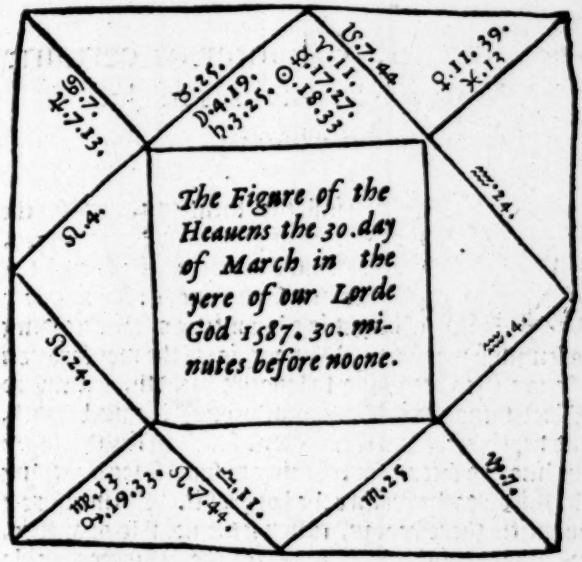
by experience you shall be more certaine. Suppose fiue signes to rise rightlie, and to fall crookedly, Cancer, Leo Virgo, Libra, Scorpio, and Sagittarius: for you shal find with euerie signe examined by it selfe, the portion of the æquator ascending together, to be greater then 30. degrées, and descending together, to be lesse then 30. degrées. Contrariwise, you shall say, that Capricornus, Aquarius, Pisces, Aries, Taurus, and Gemini, do aryse crookedly and stoping, and do fall rightly. Wherefore it is rightlie inferred that fiue signes in a croked Sphere rysing straightly, do fall crookedly, and that fiue rysing crookedly, do fall rightlie. Further it is concluded, the ascention of euerie signe, to be the descention of euerye signe set contrarie to it, and the descention of it, to be the ascention of the signe set ouer against it.

The 25. Chapter, of the finding of the beginninges of the 12. houses of the Heauens, for diuers Astronomicall iudgments.

I Wyll leaue in this place, the manner of the erecting of the figure of 12. houses of the Heauen, which the ancient cunning Astronomers haue obserued, and wyll sette downe a new way, of George Purback, and Iohn of the Kinges Mount, which they proue by most strong reasons, and affirme to bee truer then all. Wherefore they called it the way of reason, for the knowledge of which, there are foure bowes

made in our Astrolab, passing thorow by the intersectiō of the Oblique Horison, and line of the mid night, which foure bowes together, with the oblique Horison, and the Diametrall line going from the ring by the Center of the Astrolab, into the contrarie part (shewing a Meridian circle) do distribute the whole Heauen into 12. partes which we call houses. The Oblique Horison therefore, in the Orientall part, doth manifest to vs the beginning of the first house, and the degrée ascending. Then the bow following, going thorow the Horison mentioned, or the Angle of the Earth, towarde the lyne of the midnight, dooth open the beginning of the second house. And againe the other following, doth declare the beginning of the third house. But the lyne of the midnight doth serue to the beginning of the fourth house, and the bowe following toward the right hande, doth begin the fifte house, and so consequently you must goe forward, vnto the bowe of the 12. house, and there are alwaies fiue houses vnder the earth or Horison, that is, the 1.2.3.4.5.6. the other fiue are aboue the Horison, that is, the 7.8.9.10.11.12. and by this way with greate facilitie, and almost without labour, you may order the 12. houses, to euerie time offered, present, past, or to come, by example you shall perceiue it cléerelie. A certaine childe was borne, Anno. Domini. 1587. the 30. day of Marche, 30. minutes before none. I am commaunded to erect a figure at that time of the Heauens. First I find the Sunne in the 18. degrée of Aries, which I marke in the degrées of the Nette, and by the Ruler ioyned to it, I apply the same degrée in the 30. minute before none in equal houres: which done, I sée straight in the bowes and lynes of the 12. houses, the beginnings of all the houses according to order, which thinges I do set downe in a figure after this manner.

Const.



Consider notwithstanding, that 6. houses being knowne as farre as their beginnings, the other 6. are knowne most easily by a Diametrall oppositon, for the 7. house is opposed to the first, the 8. to the second, the 9 to the 3. the 10. to the 4. the 11. to the 5. the 12. to the first. To these houses, sette downe the true places of the Planets by the Ephemerides, and also the fixed clearer starres, and those of most power, and so by the example of the heauen sette downe, you shalbe easilie enformed

The 26. Chapter of certaine Geometricall measures, of heightes and lengthes.

Geometricall mensurations, are for the most part occupied about three thinges, that is about the measure of heyght of playnes, and fired thinges: the measure of height is of quantitie onely according to length, ỹ measure of Playnes, is of the mensuration of quantities according to length & breadth, ỹ measure of fired things, is of the mensuration, of length, breadth, and depth, therefore the first mensuration doth measure the line, the second the couering or superficies of ỹ thing the third, dooth measure the body of it. To measure a quantitie therefore, is, to find some notable quantitie, or howe great the part, or partes are, of some notable quantitie. Those quantities are notable, which are vsuall among all or manie. As the finger, palme, foote, cubit, pase, race, myle, a measure called Alenca, and such like. A finger is the least quantitie, which measure they vsed heretofore in measuring fieldes, containing foure graynes of Barley, in length disposed meeting together in this wise maketh a finger. A finger. A Palme hath 4. fingers, as one finger, 2. fingers, 3. fingers, 4. fingers. The Palme.

A foote hath 4. Palmes.

A Cubit hath one Palme with a halfe.

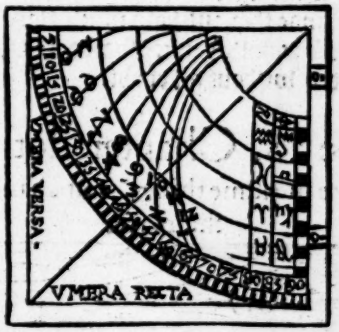
A pace hath 5. feete.

A pertick or measure of 10. foote, or a beame is a long rodde containing 10. feete.

A race hath 125. pases, of miles it pertaineth not to the purpose, because our sight can not reache so farre.

The

The 27. Chapter, doth teache to find out the height of any thing eleuated, that may become to be placed in an euen plaine without any ſhadow, by the Aſtrolab or Quadran.



ARiſtotle, the Father of Philoſophers, in the ſeaueth booke of his Topicks, hath forbidden vs to do that in many words, which may be diſpatched in few. Let vs ſpeake therefore in this place, by what meanes the height of a thing to be gone vnto, into a plain, is to be found without ſhadow. Place therefore the Inder, according to the line in the middle of the Quadrant, or Lather (that is to ſay, vpon the lyne of ỹ middle ſhadow, or the 45. degree in the Quadrant) of the fourth height, which is all one, and the Aſtrolab beeing lifted vppe, and hanged vpon your hand, ſo long moue thy ſelfe forward and backwarde, to the height

of the thing to be measured, vntill the visuall lyne going thorow both the holes of the pynnes doe meete, with the toppe of the thing, that is, vntill you see the toppe of the thing thorow the hole of both the Tables, which being found, measure the space which is from the middle of thy foote, vnto the roote of the thing elevated, ỹ quantitie of your stature beeing added also, from the playne of the earth to the sight of the eye, which alwayes thou shalt call behinde thee, and how much this quantitie is, beeing made so equall, so much shalbe the height of the thing elevated without all doubt.

The 28. Chapter doth teache to trye the same thing, not chaunging the place.



If you would doe the same thing, not stirring thy foote, goe to worke this way, take the Astrolab, and that beeing lifted vp toward the height, by mouing the Mediclinium, called the Inder, belonging

ing to the Astrolab, you shall make it fitte, vntill you see the top of the height thorowe both ỳ holes of ỳ Tables, then if the line of truth shall fal vppon the side of ỳ right shadow, it signifieth ỳ the height of the thing is greater then the space which is betwéne the rote & the height, and the middle of thy sote, and in what proportion 12. are to those poyntes, which the rule doth cut of, in the same proportion is the height of the thing, to the space betwéne thée and it, the quantitie of thy stature béeing added as we haue admonished aboue, and it is put in practise so. Kéepe the number of the right poyntes cutte of by the lyne of the Ruler, then measure the space which is betwéne the rote of the height of the thing to be measured, and thy sote by some measure knowne to thée, as by sote or paces. &c. and multiply them by 12. and let the production or number proceéding, be deuided by the number of the poyntes aboue kept, and that which shal goe from the diuision, shalbe the height of the thing the quantity of stature béeing added. For example sake, if the height of b. c. be to be measured, the space from the rote of the height to my sote c. d. is 5. pales, the stature d. e. is 2. paces, the poyntes of the Lather of the right shadow touched of the Inder, are 6. I multiply the space of 5. paces by 12. and I bring forth 60. which I deuide by 6. right poynts, and I haue 10. paces, to which I adde the stature of 2. paces, and I gather 12. paces. I conclude therefore, the height propounded to haue 12. pales. But if the lyne of truth shall fall vppon the side of the shaddow turned, then the space betwéne thée, and the foundation of the thing eleuated, is with thy stature, greater then the height of the thing eleuated, and in what proportion the poyntes are cutte off by the lyne of the Ruler to 12. in the same is the heyght of the thing to be measured, to the space betwéne thée, and

the rote of the height of the thing, thy ſtature allwayes added. Of this part this is the practiſe, kéepe to ẏ parte the poynts of the ſhaddowe turned, made manifeſt by the lyne of truſt, then meaſure the diſtaunce betwéene thée and the rote of the thing to be meaſured, by ſome meaſure knowne to thée, and multiply the ſame by the poyntes of the turned ſhadowe above marked, and that which proceédeth forth, deuide it by 12. and thou ſhalt haue in the ſame, the height of the thing, the quantitie of thy ſtature béeing added, the matter is playne, it néedeth no example.

The 29. Chapter, howe the height of a thing, not to bee gone vnto, ſtanding in a perpendicular plaine, is to be knowne.

BVt if peraduenture flodes, dytches, or ballye, ſhall bee a hinderaunce betwéene the rote of the meaſure, and the rote of the thing to be meaſured, by this manner you may finde the meaſure of the length purpoſed. In this playne, the Aſtrolab béeing lifted vp, diſpoſe the Inder ouer againſt the top of the thing to be meaſured, vntill you may ſée the toppe thorow both the holes of the Tables, and conſider warily, vpon what ſide of the ſhadow the line of truſt doth fall, which if it fall vpon the ſide of the turned ſhadow, marke how many poyntes the line of

of the Ruler doth cut off, and deuide 12. by the number of the poyntes, and kéepe the ſumme. After the place being marked in which you ſtode, goe backwarde or forward a little from the firſt place, and in the ſecond place lift vp the Aſtrolab againe, and againe looke to the top of the thing, by the holes of the Tables, and conſider the number of the points cut of by the lyne of truſt, by which number deuide againe by 12. and then ſubſtract the ſumme, comming from the firſt ſumme before ſette downe, if it ſhall be leſſer or otherwiſe, and kéepe the exceſſe or ouerplus. For example ſake. The line of truſt doth fall in the ſecond ſtation vpon 6. poyntes, deuide them by 12. and thou haſt in the ſumme 2. which ſubſtracted from the former, 4. béeing kept, the ouerplus is 2. which ouerplus kéepe. After meaſure ỳ ſpace betwéene the two ſtations or places, with what meaſure you will, and deuide the number of that meaſure by the ouerplus before kept, that is 2. and the number which ſhall come from the deuiſion, thy length béeing added, will declare that thou ſéekeſt: An example. If the number of thy ſpace be 40. féete, then by deuiding 40. by 2. which are the ouerplus, there commeth forth in the ſumme 20. féete, which are part of ỳ height of the thing, to which adde the ſtature of the meaſurer, which I put caſe to be 7. féete, and ỳ ſhalt gather 27 féete being the height of the thing elevated, and of theſe thinges a generall rule is inferred, that ſubſtraction béeing made of the ſummes aboue kept, taken from the poynts of the ſhadow turned, founde in the two ſtations. If for the ouerplus there ſhall remaine 1. the ſpace of the ſtations ſhall be equall to the height of the thing to be meaſured, the ſtature of the meaſurer béeing added, as wée haue often times ſayd, if there remayne two it ſhall be double, if thrée, it ſhall be triple. &c.

The Figure belonging to the Chapter aforesaide.



The 30. Chapter dooth teache the height of a thing erected vpon a hyll, of which height, the lower ende and top are seene, the eye beeing in a vallye to measure it.

Now



NOwe it refteth to ſhow howe the meaſure of any height in a high place, (put caſe a hyll may be comprehended of vs in a lowe place, put caſe a Wallie) this ſeemeth to bee hard, but reaſon ſearcheth euery way of nature. Euery thing therefore, which ryſing from ỳ vppermoſt part of the

earth is carried vpward, and the top beeing elenated on high, dooth passe ouer the euennes of the playn lying about it, is height, which height, if sometimes from an vnlike place it méete with Vallies and hylles in measuring. First. let the measurer séeke out in ỳ low place or Vally the naturall Horison, of his station or place, that is, some thing which hath some playnes, equall distant to the Horison, in which he may finish the worke of his measuring, which beeing founde, let him first consider the height of the hyll by two places or stations, according to the instruction going before, then let him marke the height of the Towre and hyll together by the same instruction, and then let him subtract ỳ height of the hill, from the height of ỳ whole added togeather, and the residue shalbe the height of the Towre.

¶ The 31. Chapter doth teache to try the measure of lengthes, by the Astrolab or Quadrant.



Know,



Nowledge beeing hadde of thinges ſpoken of the height of thinges ſtanding perpendicular or ſtooping forward, you ſhall eaſily vnderſtande theſe fewe thinges of ẏ meaſuring of Playnes according to the length which we haue ſette downe. For thou haſt learned by the length knowne, the height vnknowne, heere contrariwiſe by the height knowne, you ſhall knowe the length vnknowne of the Plaine. When therefore you would meaſure a Plaine, whoſe ende is ſeene, whether it be to be come vnto or no, according to the length, by the office of the Aſtrolab or Quadrant. Firſt of all diſpoſe the meaſuring Rodde, which in any caſe muſt be the ſame length, as thy ſtature is of from the eye to the foote, which rodde deuide by ſome meaſure knowne to thée, and the beſt deuiſion of it, is into 12. equall partes, which beeing diſpoſed, ſtand in one ende of the Plaine according to the length to be meaſured, and the Aſtrolab beeing hanged vp, heaue vppe or put downe the Inder, vntill you ſée by ẏ holes of bothe the Tables, the other limit or ende of the Plaine, on the ouerthwart part, which ſeene, reckon diligently the poyntes cut off by the lyne of truſt, which are almoſt alwayes the poyntes of ẏ turned ſhaddow, for then the length of the Plaine is greater then the rodde of ẏ meaſurer: by the poyntes therefore cut of aboue found out, deuide 12. and the number accounted will declare to thée of what quantitie the part of the meaſuring rodde is, in reſpect of the length of the Plaine which is meaſured, for if the line of truſt ſhall fall iuſtly vppon the

lyne of the middle shaddow, that is, vppon the diameter of the Quadrant, the length of the Plaine shal be equal to the rodde of the measurer, but if the Ruler shall fall vpon the 11. poynt of the turned shadowe, the length of the Rodde once taken, with the eleuenth part thereof shalbe the length of the Plaine. If it fall vppon the 10. poynt of the shadow turned, the length of the rodde once taken, with two 10. partes of the rodde, shalbe ẏ length of the space of the Plaine. If furthermore the line shal fall vpon 9. poynts of the shadow turned, the length of the rodde once taken, with three nine parts of the same rodde, shall be the measure of the length. If the lyne of truth shall fall vpon 8. poyntes of the turned shaddow, the length of the rodde once taken with halfe of it, shalbe the measure of the length of the Plaine. If it fall vpon 7. poyntes, the rodde is the length with 5. seauen partes, if it fall vpon 6. poyntes, the rodde twyse taken doth finish the thing sought for. If it fall vppon 5. poyntes, you shall haue two roddes, and two 5. partes. If it fall vpon 4. poyntes, you shall haue tuft 3. roddes, if it fall vppon 3. poynts you shall haue 4. roddes, if it fall vpon 2. poynts, you shall haue 6. roddes. At last, if the lyne of truth shall fall vpon the first poynt of the turned shadow, it is signified, that the space of the length is in a twelue folde proportion to the rodde. Wherefore if at last you take the rodde twelue times, you shall gather the length of the plaine.

The 32. Chapter and the laſte, of meaſuring depth.



LEt the meaſurer of ẏ depth, firſt know the quantitie of the Diameter or breadth of the Well, which being knowne, the Aſtrolab being hanged vppe, let hym applye the Inder to the mouth or vppermoſt part of the Well, or depth to be meaſured, and let him moue the ſame by lifting vppe, and putting downe vntill you ſhall ſée by the holes of bothe the Tables, the ende of the depth of the Well, of the ſide oneragainſte him, from that ſide in which hee ſtandeth, ſo that at one ſight, he may ſée the vpper ende of the Well, and the lower ſette againſt it, which done, if the lyne of truſte ſhall fall vpon the line of the middle ſhaddowe, the depth ſhalbe equall to the breadth of the Well; but if

the lyne (as for the moſt part it alwayes happeneth) ſhall fall vppon the poyntes of the right ſhadowe, the depth is greater then the length. Conſider therefore the number of the poynts, then meaſure the Diameter of the breadth of the Well with ſome meaſure knowne to thée, and multiply the ſame meaſure by 12. and ỳ ſumme by the number of the poyntes found out of the ſhadowe and the whole ſumme doth ſhowe the depth of ỳ Well, or otherwiſe more eaſie. By the number of the poyntes found out deuide 12. & the number receiued doth ſhow readily, how often you ought to receiue the breadth of the Well for the depth thereof. And after this manner deale in al other, euen ſo with the Diameter of ỳ Well, as wee haue appoynted with the meaſuring rodde.

The Concluſion.

INfinite are as yet the commodities of the Aſtrolab, wherefore we haue brought in but a fewe ſlight thinges for inſtruction ſake, but vſe and diligent exerciſe will ſhow greater thinges to thée, vſe it therefore, and truely you wyll finde ioy.

The

THE COMpoſition and framing of the *Quadrant*.

THat the Quadrant may bee truelie framed, you muſt knowe, that euerie celeſtiall Sphere, or celeſtiall circle, is ſuppoſed to haue 360. equall partes, as of the 12. degrées of the ſignes of the Zodiack, the Zodiack himſelfe is ſuppoſed to haue 12. times 30. degres. If therfore ỳ Sphere or Circle be deuided into 4. equall partes, euery equall part is called a Quadrant, and hath portions of 30. former parts.



A Quadrant therefore is so framed, the fourth part of a Circle perfect beeing receiued, let a straight lyne be drawne, about both the sections, and they wyl deuide themselues in the top and crest of the Quadrant, which intersection, is thought to be the Center, and to ẏ same let be ascribed A. and to the ende of the line toward the right hand, let be ascribed B. at the left hand C. the fote therefore of the Compasse standing vnmouable in the poynt of A. let seauen lines be drawne. D.B. to C. beeing a little distant, of which lynes, the 3. higher partes for the Limb of ẏ Quadrant wᵗ spaces intermingled, in the 18. respect of the center, are deuided with little lines drawne, and there ariseth 18. spaces betweene euerie two little lines which are brought about: euery thing of the lower partes is deuided into 5. and to euery one of the higher, by beginning from C. let one number bee giuen from 5. to 90. making progression by numbers standing on 5. and the Limb is perfect, and the line cutting of the 45. degree toward the Center must be continued, and is called the measure of height.

Let the space vnder the Limbe, next to the 25. degree and a halfe also, to the 66. degree and a halfe, be cut off. Let the first part be coloured ouer with red colour, and marked with the fierie Zone, let the seconde parte be dyed with greene colour, and marked with the temperate Zone, let the third part, be painted with a watrish coloure. and be called the colde Zone.

Let the space next to this, be deuided in the degrees following, 1. 2. and a halfe. 20. and a halfe. 27. and 40. minutes, 33. and a halfe. 38. and 35. minutes, 43. and one twelfth part. 48. and a halfe. 65. also 61. to which spaces from the line B. toward C. let the names of the

Climats

Climats be written in this order.

Dia Meroes, Dia Syenes, Dia Alexandrias, Dia Rhodu, Dia Rhomes, Dia Boristhenes, Dia Rhypheos, Dia Thyles.

Let the next space be deuided alone, in euery tenth of the degrées, and the 10. lines of these described in the Mappe of the worlde, shall signifie the Parallely reaching to the length of the earth, from the East to the West, and let the number following be written down, by the order, béeing the miles aunswering to one degrée in such a Parrallely, which are taken frō ẏ South toward the Poles, 60. 59. 54. 50. 47. 40. 32. and 28. in one space, by deuiding it in the middle, so 26. and 20. in the next, likewise 21. and 6. in the last.

The length of dayes according to the Parallely of Ptolemie, are thus sette downe.

LEt the nérest space be deuided in these degrées following, that is, 4. and 15. minutes, 8 and 25 minutes, 12. and 30 minutes, 16 and 25 minutes. 20 and 15. minutes, 23 and 50 minutes, 27 and 40 minutes, 30 and 20 minutes, 33 and 20 minutes, 36. 38. and 35 minutes, 40 and 55 minutes, 43 and 5 minutes, 45. 48. and 30 minutes, 51 and 30 minutes, 54, 56, 58, 61, 63. and these béeing so disposed, there aryseth 12. Parallely of Ptolemie, and to the first space is inscribed the twelfth part, because the day vnder the æquator is of 12 houres, in other it alwayes increaseth by the quartal of the houre, which, if it pleaseth may bee noted out hereby, that it may be done more cunningly.

Let there be framed two holes in the section A.B. finelie bored to the right line.

Let the circumferentall line be made from the Center to the distaunce of the breadth of two fingers, and beneth the circle squared with the line B. C. and let the Tryliniall line be more inward then the gymme, let euery part be deuided into 12. equall partes, or as many as they may haue, and let them bee marked in the higher by the numbers, in the lower by the vnities, ỹ rygbt line clyming to the holes, turned to the other line is called the shaddow, 12. are alwayes put to the line that measureth height.

In the Center let there be put a threde, with two Pearles or round Beades for your Margge to moue vppe and downe, a Plumett put to, in the end, to make the threde hang straight.

Let the length of the line be taken warily, which is found in the body betwæne the 2. next circumferentall lynes, and let a Circle be made by it, of some other matter, from hence let euery middle part bee deuided, from that line bæing as the Diameter, into 6. equall partes, and let lines be made, from poynt to poynt, beeing turned, and there commeth forth 5. lynes, from hence by descending by the Diameter, let the distaunces of the lynes, deuiding the Diameter be taken, and let those distaunces be marked by the poyntes in the lyne A.C. and from those poyntes, the fote standing sure and vnmouable, let lines be drawne in the Center to ỹ lyne A. C. and let Aries be written vpon the line enclosed, betwæne the two broader spaces, to the higher lyne, Taurus to the third, Gemini to the highest, Cancer, to

the

the next descending Leo, to the other Virgo, to Aries Libra, to the next Scorpio, to the other Sagittarius, to the lowest, Capricornus, to the next ascending, Aquarius, to the other Pisces.

Let euery space betweene these lynes, in the line about A. B. be deuided into so manie partes as may conuenientlie be had signifying 30. degrées.

Let the lyne A. C. betweene the line of Cancer and Capricornus, be deuided into so manie partes equall, so manie houres as longest and shortest dayes dw differ, and if you dw deuide it againe into 4. you shal haue the quarters of houres.

If from euerie fift tenne degrées of the Limb, by respect of the Center, toward the line of Cancer, you shal drawe crooked lynes, the Center béeing sought within or without the Quadrant, thou hast drawne the lines of vnequall houres.

But for the lynes of equall houres, take in ỳ Limb of the æquator the eleuation of thy Region, and putte a point in the line of Aries, vpon which line ascend in the Limb to 23. degrées and a halfe, and put a poynt in the line of Cancer, from hence descend vnder the poynt of the æquator, to so many degrées and set a marke on the poynt in the line of Capricornus, loke for the Center without the Quadrant, and when you touch these 3. poyntes, drawe a lyne which shalbe 12. in thy Region, for other Regions drawe lines in respect with this Figure, which is of valor, at London.

Houres. 12. 1. 2. 3. 4. 5. 6. 7. 8.
Of the day. 12. 11. 10. 9. 8. 7. 6. 5. 4.
Cancer. 62. 60. 54. 46. 37. 28. 18. 9. 1.
Æquator. 38. 37. 33. 26. 16. 9. 0.
Capricornus. 16. 14. 6. 0.

This figure is corrected, not by regarding a fewe minutes, of which 60. make a degrée.

Of thinges which are knowne by *the Quadrant.*



If the pearle be put to the degrée of the signe of the day appointed, the lyne is manifest both by the numbers of the houres of the day, and by the light of the Sunne pearcing thorow the holes, the pearle doth show the equal and vnequall houres, and perpendickle or the hanging downe in the Limb, doth declare the elevation of the Sunne vpon the Horison, the pearle doth showe the signe, and the degrée of the signe. Likewise, while the Sonne or starre is séene thorow the holes, the thredde doth cutte of his elevation vpon the Horison in the Limb. The Attenta in the line A. C. the poyntes béeing distaunt from the æquator, the stone of the Sunne doth showe the declyning from the Equinoctiall, the Sunne as aboue pearcing thorow the holes, and the thredde touching the lyne measuring height, or the 45 degrée, euery thing is equall to his shadow. If it fall toward B. then the thing is longer then the shadow, if to C. it is shorter

ter vnder that proportion, if it fall in the 12 poynt of the Lather in the shadow, and let one be cast awaie, the reſtone is the height, if in the tenne poynt, the shadowe is longer in the firt part: if in the 9. poynt, the shaddowe is longer in the fourth part, if in the 8. point, the shadow is longer in the third part, if in the 7. poynt, the shadow is longer in the 5. part, let the distaunce be deuided into 12. and let 5. be cast away, if in the firt point, the middle of the shaddow is the length, if in ỹ 5. poynt let the shadow be deuided into 12 partes, and let 5. bee cast away, if in the fourth point, the fourth part of the shadow doth giue the height, if in the third point, the fourth part of the shadow doth shewe the height, the same is knowne. If any man haue taken the height of a thing by sight, by the windowes of the holes, and shall account the distaunce for the shadowe, this obserued, that alwaies the height be added from the earth to the eye, if it be done by sight, after the same manner, wee must say of the poynts of the right shadow, this obserued, that as here is an ouerplus, and a casting away, so there is a wanting, and therefore must be an addition made.

The playnenes is taken, if you apply the toppe or creſt, to your eye with the left hand, and dow see the ende of the thing to be measured by the holes, the poynts wil show the deuider of the turned shadow, here bring the height of the eye by 12. to the earth, after deuide, and it is playne.

If by loking on the ground, the poynts of the right shadow cut off by the perpendickle, are receiued for the deuision, and the Diameter is multiplied by 12. the quotian of the deuision doth shewe the length.

Euery degrée from the æquator turned to the Arctick Pole, hath threéscore Englisth miles aunſwering to it, but from the Eaſt and Weſt they are otherwiſe taken, vnder and about the æquator alſo threéscore, but rather by declyning there are fewer degrées, as appeareth in the Limb of the Quadrant.

The framing of the *Sphere*.

He that is about to frame a Materiall Sphere, let him firſt make two circles to the ſtraight Angles of ỳ Sphere, deuiding themſelues, then let him make fitte the Axle trée, then the æquator with both the Tropicks, and make the æquator in the middeſt, the Tropicks diſtaunt from the æquator 23. degrées, and 51. minutes, but heere it muſt be noted, when you ſhall deuide euery circle into foure equall partes, that there are 90. degrées in euery fourth part, according to this, you muſt deuide all the ſpaces in the Circles. The reaſon of the deuiding of the 4. parte, for if you will deuide any fourth part, firſt deuide it into threé equall partes, then againe deuide thoſe partes into threé equall partes, and againe deuide euery parte of them into 10. and in euery fourth part, there wyll come vppe 90. degrées, of theſe you may either take away, or ádde to them. When the Tropicks are added, place

place the Artick and the Antartick circles, béeing also distant from the Poles 23. degrées, and the 51. minutes, almost the Zodiack, so from one Tropick to the other, that the Ecliptick may touch them both, but let it deuid the æquator vpon ỹ colure or tayle of the equinoctials, let it come néere to the Poles, vppon the colure or tayle of the Solsticie, then let the Meridian and Horison bee made according to their descriptions.

To make a Triangle béeing of equall sides, vnderstand thou, if they be framed, thorow whose Angles the one béeing put to thy eye, the other closed fast, thou shalt sée the outward parts of the thing to be measured, thy distaunce doth shewe the height.

If thou shalt bore thorow a staffe in some part of it, by thrée holes equall distaunce, and shall make fitte a sticke of one distaunce of length to the holes, then haste thou made a Iacobs staffe, if thou sée the outward parts of the thinge to bee measured by the outwarde partes of this sticke, the hole béeing put in the middle, sette a marke on the place. After, put it to the nert hole backward if you will goe to it forward, if you will go backward, while you sée the extreame part againe, for so the space of the distaunces dw show that which you séeke. So by the Lather, and Limb, the lengthes, & heights, &c. And the elevations are taken by the same way in the Astrolab.

The Cilinder is deuided into equall partes in hys circumference, the other 12. partes dw aunswere to monethes and signes: if you put the tongue to ỹ day of the moneth, it wyll declare the houres of the day.

In like sort, if you put the tongue of the Noctulab to the greater starre of the greater Beare, and shall put

the mouing whéele to the day which you vſe, the Pole béeing ſéene thorow the Center, the little tongue in the mouing whéele doth ſhow the houre of a naturall day.

If you make a circle, and ſhall place the halfe Diameter truely, you may know ẏ proportion of all things at his ſhadow, as the ſhadow is framed to the circumference, what proportion may be ſigned by their manner.

The ſpace betwéene the thumbe and the nert finger applyed to the line of life, that is, ſo, that the little finger may reſpect the loweſt ioynture in the elevation, doth ſhew the houres in the ioyntures of the hande and fift finger, and with the nayles of the other fingers, ſo that the ioynture of the hand doth ſhowe 12. houres, the other ioyntures in their reſpect, do ſhew other houres.

As the ſhadow of a rodde of knowne length, is affected to his owne ſhadow, the ſame proportion is in others, or if any rodde be erected vppe, and the meaſurer placed on the backe ſée the toppe of the thing, the diſtaunce of the eye from the foote doth ſhowe the height, the like of the eye applyed to the earth.

How often the ende of the plaine béeing ſéene, part of the hinder rodde cutte off, vppon the viſuall poynt, by the firſt part of the ſame length, is contayned betwéene the two rods, ſo often ẏ whole rod is in length.

If the Diameter be applyed to a Well or veſſell by the length, and a little viſuall rod be marked by the rod cut off in the rod lying, the depth béeing ſéene in ẏ parte oppoſed, how often a little rod is contained from the viſuall poynt of the ſight in the rod lying on the oppoſed part, ſo often the rod lying is in the depth.

Of

OF THE REGIONS AND CITties, ſubiect to the Signes and Planets, and firſt of thoſe that be vnder *Aries* and *Mars*.

♈ ♂ B*Aſſernia, Syria, Paleſtina, Englande, Fraunce, Germanie, Burgundia, Svveueland*: and of Citties with Townes, *Naples, Ancona, Ferraria, Florens, Verona, Capua, Lindauia, Cracouia. &c.*

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Vnder Taurus and Venus.

♉ ♀ *Heluetia, Irelande, Cyclades*, Ilandes, *Aſia, Cyprus* the leſſer, *Media, Parthia &c.* Of Citties and Townes, *Lucerna, Herbipolis, Tigure, Poſua, Bonony.*

Vnder Gemini and Mercurius.

♊ ☿ *Hircania, Armenia, Cyrene, Marmarica*, the lower *Egipt*, a part of *Lumbardie Flaunders*, and *Brabant*, and of Citties and Townes, *London, Louain, Brigis, Mence, Halfford, Norinberge. &c.*

Vnder Cancer and the Moone.

♋ ☽ *Numidia, Affrica, Bithinia, Carthage,* Phrigia, Holland, *Zeland, Scotlande,* the Kingdome of *Granat. &c.* And of Citties and Townes, *Constantinople, Venice, Pise, Millan, Treuers, Yorke, S. Andrewes, Lubeck. &c.*

Vnder Leo and the Sun.

♌ ☉ *Italie, Sicilie Apulie, Boheme,* Phenicia, a parte of *Turkie, Sabina, &c.* & of Citties with Townes, *Damascus, Rome, Confluence, Rauenna, Cremona, Prage. &c.*

Vnder Virgo and Mercurius.

♍ ☿ *Mesopotamia,* Babilon, *Assiria, Greece, Achaia, Crete:* and with Citties and Townes, *Hierusalem, Corinth, Rhodes, Papia, Tolose, Lions, Paris, Heydelberge, Basile.*

Vnder Libra and Venus.

♎ ♀ *Bactriana, Caspia, Thebaida, Ethiopia, Lyuonia Austrige, Oasis,* and of Citties and Townes, *Caieta, Lauda, Suessa, Placentia, Friburge, Argentine, Spiers, Franckford. &c.*

Vnder Scorpius and Mars.

♏ ♂ *Indea, Capadocia, Getulia, Mauritania, Norway, Carthalonia,* and of Citties and Townes, *Valentia, Padua, Messana, Aquileia. &c.*

Vnder Sagittarius & Iupiter.

♐ ♃ *Spayne,* Arabia the happy, *Vngary, Slauonia Celtica, Misnia,* And of Citties and Townes, *Toist,*

Tolet, Cullen, Narbona, Stutgardia, Rotenburge, Buda. &c.

Vnder Capricornus, and Saturnus.

♑ ♄ *India, Arriana, Macedonia, Thracia, Greece, Saxonie,* Heſſia, *Orchney Ilandes, Machline, Oxforde,* Brandenburge, *Conſtantia, Fauetia,* Auguſta, *Vindel. &c.*

Vnder Aquarius and Saturnus.

♒ ♄ *Arabiæ deſert, greate Tartaria, Denmark, Sogdiana, Sarmatia, &c.* Of Citties. Hamburge, *Brema, Salisburge. &c.*

Vnder Piſces and Iupiter.

♓ ♃ *Lidia,* Pamphylia, *Calabria, Normandy,* Portugal *Sicilie,* and of Citties and Townes, *Alexandria, Hiſpalis, Compoſtel, Ratisbone,* Wormes.

BEfore we do proceede with Tables of Longitudes and Latitudes of Countries, and Regions, it behoueth you to know what meaſures we chiefely vſe, as a paſe, a furlong, a league, a myle, a degree, &c. And the leaſt meaſure to begin withall, is a Barley corne, and three Barley cornes out of the middle of the eare in thicknes, maketh an inche.

12. inches maketh a foote.
3. foote maketh a yarde.
5. quarters of a yarde, maketh an ell.
5. foote maketh a pace.
100. and 25. paſes maketh a furlong.
8. furlongs maketh an Engliſh mile.

60. and 6. furlongs maketh a french league.

5. yardes and a halfe, maketh a perche or rodde to measure land by, the perche or rodde is 16. fote & a halfe long.

100. and 60. perches maketh an Aker. For as a marke of Englisth money, containeth a hundred and 60. pence, so euerie Aker of land, containeth a 100. and 60. perches. And as a noble containeth 80. pence, so halfe an Aker of land containeth 80. perches, and as halfe a noble doth containe 40. pence, so a rodde of land doth containe 40. perches.

253440. Barley cornes will reache a mile, and 547304000. Barley cornes, aunswer to 21600. myles the circuite of the earth.

16. fote and a halfe, maketh a perche, that is fiue yardes and a halfe, 600. fote, by fiue score to the hundred, maketh a hundreth, that is, 38. perches sauc two fote. 8. furlonges maketh an English mile, that is, 5000. fote. So 300. and 3. perches, is an English simple. Now you know what measure is chiefely to be vsed, it is necessare also, that you shoulde vnderstande, what a degrée of Longitude & Latitude dooth containe. A Longitude is the length of a thing, and a Latitude is the widenes or breadth of the same. as for example.

The circuite or compasse of the earth, doth containe 360. degrées: and from the South Pole to the North, we call it the Latitude, and from the westernly Canary Ilandes to the East poynt we call that the Longitude, (next followeth what a degrée of Longitude and Latitude is, but before I proceede any further, it behoueth you to know some what of the Zodiack, that is to say, the great Circle in the *Mobilæ*, and marualous Seate of the firmament, for Ptholomie saith, that the Zodiack

of

of the Heauen, is a great Circle, sette and deuided in 8. or 9. Spheres of the firmament, the which Circles is deuided into 12. euen partes, and the Philosophers do call the 12. euen partes, the 12. signes. that is to say, Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagitta. Capricor. Aquari. and Pisces. And these signes doth showe vnto vs, in what part of the Heauen the Sunne, the Mone and the Planets be, in the 12. signes, by distincte places. The lyke may be known of Philosophers, by notable starres, and euery signe is deuided into 30. degrées, and euerie degrée into 60. minutes, and euery minute into 60. secondes, and euery second into 60. thirds. Now multiply 12. times thirty, and it yeldeth 360. degrées, and euery minute of a degrée, aunswereth a mile vpon the earth, and euery degrée 60. miles in Latitude. And the like in the Longitude in the East and West line. Nowe will I showe you how to finde out the Longitude and Latitude of anie two places, by the degrées in the Zodiack, as for example.

I take the eleuation of the North starre at Portsmouth, the which is the furdermost place of the South part of England, and I finde it 51. degrées, 20. minuts. In like sort at Twadmouth, the furdest place North in England, whose Latitude is 56. degrées 49. minutes, The difference of these two eleuations, is 5. degrées 29 minutes. Also the direct distaunce from Portsmouth to Twadmouth, is 329. miles, now deuiding the 329. (which is the portion of the earth, answering the difference of these two eleuations) by 5. degrées and 29 minutes, which is the difference, I finde the quotient to be 60. wherfore in all places in England, 60. myles aunswereth to one degrée of any great Circle in ỳ Heauen. The like prepositiõ may bee put betwéene any

two Cities and Townes, mencioned in the Tables of Longitudes and Latitudes, (ỹ difference of the degrées and minutes betwéne them) will declare howe many miles the one is distant from the other. And to measure the compasse of the whole earth how many miles it doth containe, you knowe that euery minute of a degrée aunswereth a mile, and euery degrée 60. miles, and if one minute of a degrée in the Zodiack, aunswereth a mile vpon the earth, what doth 360. degrées answer, I worke in Arithmatick in this wise, I multiply 360. degrées by 60. minutes, because therefore minutes answereth a degrée, and euery degrée aunswereth 60. mile and it yéeldeth 21600. mile the whole Circute of the Earth, I wil moue vnto the ignorannt and simple people an other question, that may séeme merueilous to them for lacke of knowledge and vnderstanding in Arithmaticke. The Sun by violence contrarie to his proper motion, is caried round about the Earth in 24. houres, I wold know how far he is caried in an houre, (you haue heard already ỹ 15. degrées maketh an houre) & euery minute yéeldeth a mile, & euery degrée 60. miles now I multiple 15. degrées by 60 minutes and it yéeldeth 900. I conclude, and say that the Sunne is caryed by the rauishment of the firmament, 900. miles in an houre. Then it séemeth that the Sunne, was caryed faster then an Arrowe could be shot out of a strong bow the which is merueilous in our expectation, because we can not sée him to moue so fast in our sight, the reason is because of his extreame height from vs.

An other proposition of the Sunnes motion, if the Sunne be caryed 900, miles in an houre, howe many miles is he caryed in 24. houres. I answer, I multiplie 900. miles by 24. houres, and it yéeldeth 21600. miles the Circute of the Earth in a day naturall.

¶ An other Queſtion.

IF the Sunne be carryed 21600. miles in a day naturall, how many miles is the Peregrination about the earth, in 365. dayes and 6 houres, the which by moſt computations is a yéere, I worke in this wiſe, I multiplie 21600. miles the which the Sunne is carried in a day naturall, by 365. dayes and 6 houres, and it yéeldeth 7884000. then may I conclude and ſay, that ſo many miles, he hath compaſſed in going aboute the Circute of the earth in a yéere.

An other queſtion, and ſo I ende.

THere is from the creation of the worlde to this yéere 1587. in yéeres 5549. I would knowe howe manie times, the Sunne hath made his perigrination about the Circute of the Earth, and what number of miles in all theſe yéeres, I worke in this order, I multiplie. 5549. by 365 daies and 6. houres, and it yéeldeth. 1925285 then may I conclude and ſay, that the Sunne hath compaſſed the Earth ſo many times ſince the beginning of the worlde. And the miles that the Sunne hath gonne in his Peregrination about the Earth, from the Creation of ẏ worlde till this yéere 1587. is 43688316000 And in like manner did the famous King Alfonſus, Calculate his Aſtronomicall Tables, containing ẏ moving of the heauenly bodies, which haue their moving by a double mooving, by their owne kinde out of the Weſt to in the Eaſt, againſt the moving of the firmament, and by other moving out of the Eaſt into the Weſt, and that by rauiſhing of the firmament, by violence of the firmament, they be rauiſhed euery day out

of ỹ Eaſt into the Weſt, as before you haue heard how the Sunne is carryed euery 24. houres. Thus I haue ſhewed you the proportions of meaſures, the degrees of Longitudes and Latitudes, the degrees of the 12. ſignes in the Zodiacke, how many degrees anſwereth an houre, and what minutes an houre containeth, and how many miles vpon the Earth anſwereth a degree, what number of miles the Circute of the earth containeth, and how to finde out the diſtaunce of miles, betweene any two Cities or Townes, by the elevation of the Northe ſtarre and Southe, with other prittie queſtions in Arithmatick, of the Sunnes Peregrination about the earth, both hourely, dailie and yerelie, very pleaſaunt for all ſortes of perſonnes, which are deſirous to recreate them ſelues in this delectable ſtudie. And now to proceede forewardes how to direct a ſhippe, it behoueth the good Nauigator, not onely to haue knowledge in Pappes and Cardes, (but alſo) in the Mathematicall inſtruments, the vſe and working whereof is already at large declared, and for the readines in finding out of any place or places, knowen or vnknowē vnto them, in their Peregrinations or Trauels, I haue Collected and gathered out of Strabos, 2, and 17. booke, Plinius 8, booke, Ptolemæus workes, and other learned Authors which hath made obſeruations in many Countries. Tables of Longitudes and Latitudes, of Prouinces, Ilandes, Cities, Townes, Villages and hilles, both in Europe, Africa, Aſia, and ſome parte of America, and the firſt parte to beginne with all vnder Europe is Scotland, and as for the coaſtes of England and Ireland, I ouer paſſe them for diuers good conſiderations, I hope in God our Engliſh Nauigators and Saylors, are all ready Sufficientlie well inſtructed and acquainted with the ſame.

Of

Of Scotland.

The Chiefe Citties and Townes are these folowing.

The two first numbers shew the Longitude with his minuts. The two second, shew the Latitude and his minutes.

S. Andrewes whose Longitude is 16. degrées. 40 minutes. Latitude 57. 55. minutes.

Dun Baur 17.0.59.30
Dundie 19 20.59.30.
Dunkel. 19.20.58.0
Edenbrugh the chiefe citie in Scotlande.
17. 15. 59. 20.
S. Johns. 15.40.59.15.
The middes of the 30. Ilands adiacent to Scotland.
Orchney Longitude 30. 0. Latitude 61. 40.
Of the Iland called of Ptolemie, Thyle.
The mids of this Ilande. 70. 0. Latitude. 65. 30.
Harsol a cittie. 7,40.60.42
Thirtes a citie 5.50 64.44
Nadir a cittie. 6.40.57.20.

Of Corsica.

Corsica an Ilande, whose chiefe places are.

Istria 30.30.40.15.
Mariana 30,10,40,20,
Nebia 31,0,40,40,
Aleria 31.25.40.20

Cicilia an Ilande.

Palerna. 35.30.36.10
Marsara 25.20.35.30
Gergentum 26.20,35,10,
Termine 35,55,36,5,
Pula 36,0,35.30,
Siracuse 37,20,35.30
Catua. 37.40.36.0
Messina. 30.0.36.40.
Aetna the burning hill. 37. 10.35.20.

Of the chiefe Citties and Townes in the Ilande of Sardina.

Sardos 30.20.38.58.
Galea 29 40.37.50
Argetara 29.30,36.30
Arestana 29,45,36,50
Aquilastrum 31,20.37.30.
Cambonara 31.30. 36.30,
Stira 30.30.36.40.

Of the Ilandes called Maior & Minorica.

Maiorica containeth in B.ii. Longi-

The two firſt numbers ſhew the Longitude with his minutes. The two ſecond ſhew the Latitude with his minutes.

Longitude and Latitude.
17.40.38.30

Minorica. 20.0.39.0.

Theſe bee adiacent to Spayne.

The next Cadira an Ilande.

Cadira, which is alſo called the Gades, in the weſt Ocean, vnder 5. degrées, 30.34.0.

Eubœa an Iland.

Eubœa, now called Nigropont: is an Ilande to Achaia ioyning. 54.0.38.0

Creta an Ilande.

Creta now called Candie, an Iland famous. Longitude is, 55.0.35.20.

Cyclades.

Cyclades are Ilandes about Delus. 56.10.37.20.

Sporades Ilandes.

Theſe Ilands are alſo ioyning to Delus, their Longitudes and Latitudes.
56.10.37.20.

Thus endeth the perticuler diſcription of the chiefe Ilandes in Europe.

Of Spayne I wil perticularlie touch the chiefe Cities and Townes, beginning with Caſtilla, whoſe principall Citties & Townes are, Tolet, where the famous King Alfonſus made his Aſtronomicall Tables, containing the moouing of the heauenly bodies, whoſe Longitude and Latitude. 10.49.37.0

Salamanca. 7.20.38.20.

Valeria now called Concha. 11.34.43.5.

Alcala de Enares 10.20 41.40.

Logronyo. 12.10.44.0

Valtadolit. 10.10.42.0

Gallicia.

Compoſtella, where Sa. James was, 7.0.42.15.

Lands ende. 4.23.44.2.

Almoiſa. 4.40.44.45

Bilbao. 11.45.45.25.

Fontarrabie. 13.13. 44.15.

Saint Sebaſtianus. 15. 30.45.5.

Nauarre.

The two first numbers shew the Longitudes with his minuts. The two second shew the Latitude and his minutes.

Nauarre.

Pompelon. 13.15,42.0
Vaganna 12.15.43.0

Cathalonia.

New Carthage. 15, 57 38. 0.
Tarragone 16.12.41.0,
Gerona 17,42.42.12
Barsalona 17,0.41.35
Valentia 14.38,36.10

Arragonie.

Sarragosa 13.45.41.45,
Burges. 10.33.42,48.

Portugale.

Lysbona. 5.0.36.40
Portugallo 4.56.41.35
Arcobziga 5,40.36.35.
Badaioz 5,20.39.0,
Cabo of S. Vincention. 2. 32,38,15.
Braga 6.0.43.40
S. Maria Gadalupe, 8. 30,39.30.

Granate.

Granate 8.34.34.20
Hispalis 5.42.37.0
Cozduba 7,4.37.50
Calpe, both one, ỹ pyllers of Hercules, and also a Mountaine called at thys daie Gilbaltar, where the streite is named Zibalter 7,30.36,15
Vama 6,15.38.25
Pagala 8,50.37,30.

Of Fraunce.

Fraunce containeth many Dukedomes, it is replenished with pleasant Citties and Townes, of which I will set out the principall, beginning with the West part first.

Narbona hath

Vienna 26.0.45.6
Ebredunum 28.8.43.30
Brianſonum. 28.30.45.0
Gratianopolis Granoble. 27. 0.45.30.
Tarantasia. 29.0.45.0
Gebene. 28.0.45.45

The two first numbers shew the Longitude with his minuts. The two second shew the Latitude with his minutes.

Mauriana	28.30.44.30	Agata	24 0,42.10
Vapincum.	27.15.43.30	Mirapiſte.	22 45.42,15
Dinia	27.35.43.5.	Lodeua.	23.45.42.50
Valentia	26,0 44,10	Beſerium.	23 30.42.20.
Romonum	26.0.44.30	Mons peſſulanus, Monpe-	
Siſtarica.	26.45.43.20	leier.	24.30.42.50.
Viuarium	25,45.43.45.	Aſtrericum.	23. 0.43.0.
Auraſicum	26 30 43.30	Vabra	23.15.42.45
Auinio	25,45.43.15	Varinum.	22.15.43.15
Carpentorate.	26.5.43,15.	Albia	23.30.43 40
Tritaſtra	15.45.43.0	Montalbanũ.	21,30.43.30
Arelatũ. Arles.	25.50.42.45	Cadurcum	22,0.44.0
Maſſilia	26.30.42,5	Rhodium	23.15.43.30
Tollona.	27.30.42,0	S. Florus	23.30.44.0
Barcellona	28.30.43,15	Anicũ Lepny.	24.30.44.15

Aquitania.

Burdigala	18.0.44.30
Baiona.	17.30. 44.30.
Maſaticum	18.15.44.0
Tarba	19.15.42.15
Lorona	18.10.42,0
Lebretum	18.30.43.10,
Auſcus	20.15. 43.0
Lombarium.	21.20.42.40
Tolofſa	22.10.42.50
Rinum	21.45.42.15
Conſerana	22.15.41.50
S. Pontius	23.0.42.15
Narbona.	23.30.42.0

Celtica Gallia.

Lugdunum. Lyons.	26, 0. 45. 15.
Niuernium	24.0.46.44
Lamouica	21.30,45.45
Petragoricũ.	21.15.44.40
Engoliſma	20.30.44.50.
Xantona	19.0,45,0
Luriona	18.30.46.30
Nauetum	18 15.47.15
Rhedona	17.30.48.10
Turonia Tours.	20.15. 47.30.
Aurelia Orleans.	20.0

The two first numbers shew the Longitudes with his minuts. The two second shew the Latitude and his minutes.

47.30.

Constantia. 18.40.49.35
Paris the heade Cittie of Fraunce 23.30.48.40.
Seno. 24.0.47.45,
Cathalanum 25,30,48.30
Lingo 26.30,47.30

Gallia Belgica.

Rothomagus Roan, Longitude,21.30 Lati.49.30,
Catalaunum Chaalon,21. 30. 48. 30
Rettena. Rethe. 22. 26. 49. 0.

Germanie. The chiefe Cities & Townes.

Zeland an Iland. the furdest confines of Germanie the middes of it,in Longitude & Latitud. 25.0.52.0.
Middleburough.25.26.51.48

Hollande.

Traiectum. Utrick. 27 15.52.20.

Antwerpia.

Antwerpe, sometime the noblest Towne in all Europe. 26,36.51.28.
Louaine , a Universitie. Longitude and Latitude. 20.36.50.59.
Bruxella Brussell. 20. 20.51.15
Mechlinia Machelen. 20. 20.51.15.
Lira. Liere. 20.24.51.21

Flanders.

Candauum Ghent. 25. 30. 51. 15.
Bruge Brug 24.30.51.20.
Tornacum. Tornay. 25. 15. 50. 10.

Picardie.

Ambianum. Amiens, 16, 40.49.49.
S. Iodocus. 16.52.52.0
Samarobriga 22,20.52,10

Lucenburge.

Lucenburgum. 25.30 50.0

The two first numbers shewe the Longitude with his minuts. The two second shew the Latitude and his minutes.

Creutznacum. Creutz. 24. 34.50.2.
Sarbruccum. Sarbruck. 23,47,49,16
Keyserluterna. 24.44. 49.22.

Gulich.

Bonna, Bonne 23.23 50. 47.
Juliacum Gulich. 22.44. 51. 8.
Leodium Ludich. 21. 48 50. 51.
Aquisgranum, Achen, 28,45.50.55.

Geldria.

Geldria, Gheldere. 23,48, 51, 42

Cleuia.

Cleuis Cleff. 22.6,52.0

Heluetia.

S. Gilus. 27.6,47.8.
Constantia. 26.43,47,30
Tigurum Zurch. 26.36
46. 48.
Badena Badē. 25.16.48.44
Lucerna. 26,0.46.34.
Friburgum. 37.30. 51.50.
Berna. 24.18.46.25

Alsatia.

Colmaria 24,3,48,12.
Selestadium Schlestad. 24.6,48, 22.
Celarmontanum, Keyserſperg. 23. 48. 48. 14
Hagenoia, Hagenau. 24. 36, 49, 7.

Citties of basse Germany.

Colonia Agrip. 29.45.5.0.
Campena, Kampen. 23. 30. 52. 50.
Constuence, commonlye called Coblentz, where two fayre Riuers, the Rheine and Mosel, meete. 30,15,50. 20.
Andernachum, Andernack 30. 0. 50. 25.
Citties and Townes of high Germany.

Maguntia,

The two first numbers shew the Longitude with his minuts. The two second, shew the Latitude and his minutes.

Maguntia, Mentz, ỳ Arte of ỳrinting firſt founde (by Iohn Fauſtus,) in the yére of Chriſt our Sauioure. 1453. The Longitude and Latitude. 31.15.50.0.

Wormatia Wormes. 31.30 49. 40.

Spira Spier. 31.30.49.15

Argẽtina, Straſsborough a notable Cittie. The Longitude and Latitude is. 30.15.48.45.

Baſilia Baſile. 29.45.47.45

Schathuſa. 28.0.47.28

Curia, Chur. 32.0.47.30

Veſalia, 26.20.51.30,

Francofordia. 31.40.50.10

Curia. 32,0.47.30

Marburgum. 32.10.51.0

Bremen. 32.10.53.40

Hidelbergum,

called Hidelberge.

Lon, & Lati. 32,0,49,30

Ulmes. 33.0.48.30

Herbipolis Wirtzpurgk, 33.33.50,0.

Amberga. 34.0.47.15

Auguſta. 34.0.48.15

Brunſuiga. 34.40.52.40

Ingolſtadiũ. 34.45.48.30

Hamburgũ. 34.0.54.30

Limeburgum. 34.45.5.45

Ratiſbona. 35.40.49.0

Erdfordia. 35.0.51.10

Lubecum, 35.20.54 50

Liptzigum. 36,30.31.30

Magdaburge. 36.10,54 50

Saliſburgum. 36,30.47.30

Brandenburgum. 37.20,52.40.

Roſtochium. 37.10.54.36

Miſna. 37.20,51,50

Peurbachiũ. 37.35,48.15

Berlinum. 38.30,52.50

Praga. 38.20,50,6

Cripſualdia. 38.5.54.20

Vratiſlauia 41.20-51.5

Gran 42.50.47.15

Poſna 42.0.52.45

Buda. 43 0.46.50

Lonfeth 43.20.52.30

Thorn 43.30.53.30

Cracouia 44.30.50.15

Mons Regius. 49.0.45.0

Dantiſcum 46.0.54.55

Carolaſtadiũ. 33.25.50.0

Norimbergum 34.40.49.30

Munſter 32 0.52.5

Witenberga. 32.10.55 40

Moſcouia.

Moſcouia is a long and ample Region, the chiefe

The two first numbers shew the Longitude with his minutes. The two second shew the Latitude with his minutes.

Cittie of their Emperor is also called Moscatia.
Longitude and Latitude.
69.0.57.0.

Illeria and Dalmatia.

Illiria which is called Lyburnia, hath on the North partes Pannonia, on the West Istria, on the South Venice, and on the East Dalmatia. The chiefe Citties and Townes are,

Sara	40.5.44.9.
Stridona the Countrey of S. Ierome.	42,20.43.20
Flauona	77.0.44.45

Dalmatia.

Ragusa	45,0.42,20
Sibinicum.	43,0.43.20
Scutara	45.30.41.30
Saloniana	45.0.43.20
Durazo	45.55.40.55

Italie and Lumbardie.

Brundusium.	41.0.39.30
Tarentum	40,30,39.15
Salenum	37.20.39.30
Naplis	38.50.39.55.
Capua	36.40.40.5
Aquilea.	36.40.41.10.

Roma.

Rome a Cittie. Longi. and Lati.	36.40.42,0,
Siena	34.10.42.0
Florence.	34.15.42,45.
Viterbia	35.0.41.15
Pisa.	33.0.42.15
Luca	33.30.42.45,
Ancone	36.40.42.30
Bononia	33.30.43.40,
Rhauenne	35.0.43.15
Farraria	34.10.43.50
Parma	32.30.43.50
Verona	34.0.44.25.
Venice	35.30.44.45
Padua	35,0,44.45
Mantua	33.10.44.10
Mincentia.	34.39.44,20
Cremona	32.45.44.20
Placentia,	32.30.44.20
Mylan	31,45,44,15
Tortona	31.30,44,0
Genua.	31,30,43,15
Taurium.	30.40.43.45
Pisa	29.30.42.40

Secusa.

The two first numbers shew the Longitudes with his minuts. The two second shew the Latitude and his minutes.

Secusa 29.45,44.0
Grassa 29.50.42.55
Albinga 30,40.42.55
Vercelle 30.30.44.30
Novaria 30,15.45.0.

A perticuler description of Greece. And first of Macedonia.

Macedonia hath on the North part Thracia, and the higher Mysia: on the West, the Venetian seas, on the South partes Epirus and Achaia: on the East, the Seas called Egeum Pelagus. The principall Citties & Townes of it, are Thessalonica, now Salonica the seate of the chiefe Bishoppe of the Philippians, vnto whome S. Paule wrote two Epistles, the first from Athens the second from Laodicia. The chiefe Bishoppricke of Phrygia, where also S. Paule preached the Gospell. 49. 50. 41.0
Apollonia. 15,6,40,10.
Aulon 44.50.39.56
Bullis 45.0.39,45
Arethusa 50.10.41.0
Panormus 54.40.41.0
Hadrianapolis. 50.55, 44.45.
Ampelus. 51.15.40.43.
Joleos 51.3.39,15
Demetrias. 50.30.38.56
Larissa 51.20.38.50
Thebe. Thebs. 51. 10 38. 30.
Armilla. 45.20.40.40
Elima 45.40.39.40
Amantia 46.0.39.40
Albenopolis. 46.0.41.0
Europus 46.30.41,20.
Apsalus 46.20.41,5
Parocoplis. 48.40.41.40
Amphipolis. 50.0.41,30.

Philippis a Cittie where the great Alexander was borne, and from this Citty S. Paule sent his seconde Epistle to the Galathians. Longitude and Latitude. 50.45, 41.45
Heraclia. 47.40.41,30

¶ Epirus, whose chiefe places are

The two first numbers shew the Longitude with his minuts. The two second shew the Latitude and his minutes.

Nicoplis. 47.30.38,30
Cassiopa 47.0.38.45
Ambracia.iarta 48.8 38.20
Athenæ, sometime the Fountaine & Wel-spring of all good Letters, heere didde Plato and Aristotle teach, it is now destroyed. 52 45. 37. 15.
Megaris, 52.19.77.30
Peloponesus Morea. 51. 10. 37. 30.
Dodonam 48.30.26.0
Parnassus, a mount. 50 20. 38. 0.
Helicon the holye Hyll of the Muses, at ẏ foote wher of is a Fountaine. Longitude and Latitude. 51.0. 37. 47.
Pythia, the place where Apollo gaue Oracles. 50, 30,37. 45,
Constantinople, sometime a Cittie vnder the Christi an Empire. 56. 0,43,5
Corinth, the Bishops seate in Achaia: hether S. Paule wrote two Epistles, the first from Philippis, a cittie in Macedonie, by Stephen Fortunatus, and Achaicus. The seconde Epistle by Titus and Luke. 51. 15.36.55.
Stymphalus. 50.20.6.20.

Thus endeth the perticuler description of Europe.

A PARTICVLER DE-scription of *Affrica*.

AFrica, beginneth at Gaditanum Fretū, (a narrowe straight comming out of the Ocean into the middle earth Seas, and haue Spaine on the Northe shore, and the Mores on the South.) And it doth ende at the Egiptian Seas, On the North it haue the middle earth Seas, on the South shore the great Ocean, on the East ẏ Sea, which stretcheth almost to the middle earth Seas. Affrick is deuide in two partes by the Hill Atlas, which the lesser extendeth to the middle Earth Seas: the greater part goeth beyond this Hill vnto the South Ocean. The greater part of it is not inhabited for two causes: one is for the extreame heate, beeing vnder the burning Zone, the Sunne draweth all the moisture of the earth from it, so that for want of water no man can there liue. The second is for the innumerable multitude of venemous Wormes, and wilde Beastes, which are naturally enemies vnto mankinde. As the Lion, the Oliphant, the Tiger, and such like. Also Dragons, Corcodiles, Cocatrice, and sundrie other venemous Wormes, in such sorte, that the inhabitauntes are compelled to put on Bootes, for better auoyding theyr stinge and poyson. The part that is inhabited, is fruitfull enough. The people blacke, Sauage, monsterous, and rude: yet in those Countries, Citties and Townes where the Spaniards, Portugales Italians, and other do frequent, the people are somewhat more ciuill, modest, and reasonable, and if you desire a longer discourse touching Affrick her inhabitantes, and commodities, reade Strabo second or 17.

bookes, and also Plinius his 8. booke, with diuers other writers which at large doo hereof intreate, and now I doo meane to followe, and set out the notable regions which Ptolomæus numbreth to be 12. with their cheefe Citties, Townes, Hilles, and Riuers, with in Affrica: and first will beginne with Mauritania, which is deuided into Mauritania Tingitana, and Mauritania Cæsariensi.

Of the principall places in Tingitana, or Barbarica, Mauritania,

Fesse. 10.0.30.0
Tinges Cesarica called commonly Tanger. 6.30 35. 40.
Abilis one of Hercules pillers, is a Hill against Calpe, an other Hyll in Spaine. 7,50.35.40
Baba 8.10.34.20
Banasa 6.30.34.20
Septa 7.30.35.55
Sala 6.15.34.0
The Sunnes Mount. 6. 45.31.15
Benta. 9.30.33.40
Dozathe 10.10.31.15
Mamusida 7.15.34.15

Mauritania Cæsariesis.

Apollos promontorie. 15. 30. 33. 40
Julia Cesaria. 17.0.33.20
Tucca 20,0.31.30.
Hippa 20.15.29,50
La Guardia. 12.0,34.20
Cilla Ceriel 18.45.32.10

In Africke the Lesse.

Colops the greater. 27. 40, 32, 20.
Colops the lesse. 29,20 32. 35.
Hippon. 30.30,32.15.
Utica, where Cato died, now called Benfert. Lat. and Lon. 32.0.32.45
Carthage 34.40,31,50
Clupea. 35.0.33.20.
Sabatra 41.0.31.0.
Thasanum 33.15.32.20
Dabia. 33. 0, 29. 40

Numi-

The two first numbers shew the Longitude with his minuts. The two second shew the Latitude and his minutes.

Numidia.

Culuca. 28,30.31.0.
Tucca 29,30.31,20.
Bizancina. 37.50.30.40
Capsa 37.30,29.45
Calatha. 31.0,53.40
Sabrata. 41.15.30.15.
Ammon 65,30.28.0
Mons ỳ great. 59. 20.26.55
Alexandria. 60.30.31.0
Memphis 62.50.29,50
Cayrum. 62.15,30,0.
Syenne 62.15,23,50.

Libia interior.

Tagaza 7,0.15.40
Tuchorora 12,30,16.0
Tambutum. 15,30,15.40

Meroe.

Meroe is an Iland of Nilus, sometime called Saba where S. Mathewe did preache the Gospell. From hence came the Quéne of Saba, to heare Salomons wisedome. 61,30.16,25

Quiola.

Quiola, or Cayla, is a Region, in which great plentie of Cinamon growes, the chiefe Cittics are.
Hamaharica. 65.0.9.10
Malka. 67.30. South pole. 4.15
Beritis 60.40.21.31
Quiola. 76. 30. South pole. 7.30
Sabath 67.30.12.30
Mombaza 79.0. South pole. 6. 0
Melinda. 82.30.2.0
Canaquin 80.0,9.50

Babell mendap. There are the straights of ỳ Red Seas. 74.50,11.0

Of Cities of sundrye Regions in the South Æthiopia.

Goia. 60,50. S. pole. 19,50.
Garma. 57.0. S. pole. 24.0
Bali. 70.0.21,40
Meli 33.0.16.30

Of the notable Ilandes about Affrick.

Porto sancto. 0.35,31.30

The two first numbers shewe the Longitude with his minuts. The two second shew the Latitude and his minutes.

Pedera an Iland, first inhabited of the Portugales it aboundeth wyth Suger, Honie, Ware, and sundry Hearbes. 358.40.29.50.

The Canarian Ilands being 10. in number. 1.30. 23. 30.

S. Thomas Ilande. 32. 30. 0. 30.

Madagascar, which is also called S. Laurence Iland. Where the North Pole is not seene, and the Needle in sayling wil do no seruice. Therefore they are constrained to vse Astrolabs, and other Instruments 85 30. Southpole. 20.0.

Thus endeth the description of Affrick.

Of *ASIA*, THE THIRD part of the Earth.

ASia is as much as Europe and Affrick, and containeth (after Ptolemies account) 48. Prouinces. It is parted into Asia the greater, and Asia ỹ lesser, Notwithstanding, diuers wryters vse this word Asia the lesser, more largely then Geographers doo. For they call all that portion which is within the South shoare of the Pontick seas, and

and the East Seas Pelagus Ægeum, and the Northe part of our Ocean, and the West parte of the Ryuer Euphrates, to be Asia the lesser. Asia containeth in, Bythinia, Pontus, the lesser Asia, Lycia, Galatia, Paphlagonia, Pamphilia, Capadocia, the lesser, Armenia, & Cilicia. Asia doth farre excel both Europe and Affrick, for it is fruitfull, and hath so pleasant fieldes, such plentie of foder and pasture, the heauens gyuing moysture to the earth in due season. It hath aboundaunce of gold mines. It bringeth forth plentie of Cynamon, Ginger, Aloes, and diuers Aromaticall spyces, & Gummes. There are diuers straunge Beastes bredde in Asia, as, Unicornes, Cammelles, Liberdes, Mermosites, Mercats, Cryppes. Yet one thing is to them infortunate, that there are terrible and many Earthquakes, in so much that there hath béene tenne, and 12. Citties at one time subuerted and ouerthrowne. The Inhabitants are sundry, and diuers: for some are Anthropophagi, which eate flesh of menne, and drinke theyr blood. There are also Pygmeans, (men but a Cubite in height) which ryding on Goates and Rammes, do kéepe warre with Cranes. There are diuers other formes of Inhabitaunts recited of Plinie, which at this present I wyllingly ouer passe. The spirites in this Countrie, by many illusions, séeke to bring Trauyalers into daungers, sometime by calling them by their names, other times by Musicall noyse, as it were alluring them by sweetenes of the sounde, vntill they bee brought into daunger through wylde beastes. But now (these thinges omitted) I wyll briefely sette downe the principal places of Asia, beginning with Pontus & Bythinia.

The two first numbers shew the Longitude with his minutes. The two second shew the Latitude with his minutes.

Pontus and Bythinia.

Chalcedon 56.20.43.5.
Olbia 57.0.42.40
Nicodemia 56,0.42.40
Claudioplis, where Saint Luke did wryte his Gospell and the Acts of the Apostles 59.30.42.45
Nicæa, where the Nicene counsell was, 58.0.42.15
Cæsaria, Smirdiana. 56, 40.41.40.
Olimpus, an Hil of which I spake in the first Booke. 57.0.41,40.

These following are properly called Cities of Asia.

Lampsacus. 55.20.41.25
Illium, sometime called Troy, now ruinous. 55, 50. 41. 0.
Dardanum, Dardanellum 55,25,40.5
Alexandria 55.25.40.40
Antandrus 56.30,40.20
Smyrna, ỹ Country wher Homer was borne. 58. 25. 38. 25.
Assum. 56.30,40.15
Ephesus, the chiefe Citie in Ionia, in which S. Iohn wrote his Gospell. 57. 40.37.40.

Citties of Caria.

Heraclea 58.50.43.30
Miletus 58,0,37.0
Nysa 59,0,38,15,
Antiochia 59,30,38,20
Neapolis. 59,25,38,35
Trallis, which is also called Emanthia, at which place certaine suppose Pigmians inhabit. 58.40.38.5

Of bothe Lidias.

Philadelphia. 59,0,38,50
Sardis 58,20,28.15
Sala 60.15.38.20
Sanis 60.0,38.20
Hierapolis 55.20.38.15
Apamia 55.30,42.0

Citties of Lycaonia, or Licia.

Carya 59.50.35.55
Patara.

The two first numbers shew the Longitude with his minuts. The two second, shew the Latitude and his minutes.

Patara 60.30.36.0
Olimpus a Cittie. 61, 30.36.10,
Xanthus, patara. 60.30 36, 40.
Nigra 61.0.36.45

Citties of Galatia.

Sinopaltala. 63.30.43,0
Pompeiopolis, so called because Pompey builded it. 62.0.42.0
Claudiapolis. 63,15,42,20.
Ancyra 62.40.42.0
Leodicia 60.15,38.40

¶ Of Pamphilia.

Olibia 62,0,36.55
Magydis 62.40.36.55
Seleusia 62.0.38.30
Antiochia 62.30.39.0

Citties of Doris.

Alicarnassus. 57.50.36.10,
Cadmos a hil. 59.40.37.40
Phenix an hil. 58,0.36.30,
Apollonia. 57.0.39.45,
Pargamus, héere was the noble Phisitian Galenus borne, which made phisick perfect, & erpoundes Hippocrates. 57.35.39.45

Capadocia.

Trapezus Geñech.
Sebastopolis. S. Greg. 66.0.41.20.
Archelais 64.45.39.40
Zama 65.0.40.45
Cœsaria Maza, héere was Basilius Magnus Byshoppe. 66.30,39.30

Of Armenia the lesser.

Satala. 96.50.42,10
Nicoplis 69.20.41.40
Ispa 70.30.40.20,
Camana 68,0.38.0.
Claudia 71.0.38 45,

Cilicia.

Antiochia. 64.40,36.50
Agæa 69.0.36.30
Seleucia. 66,10.36,45
Tarsos. S. Paules Countrey. 67. 40. 36.50
Epiphania. 69.30.36.0,

Of Colchis.

Neapolis. Negapotimo, 71.30.45.40.
Capolis. 72,0.45.30

The two first numbers shew the Longitude with his minutes. The two second shew the Latitude with his minutes.

Phasis 72 30.45.0
Madia 74.15.46.15

Of Iberia,

Sura 75.0.45.20,
Zalissa 76.0.44.40
Uarica. 75.20.46.0.

Albania part.

Gelda 83.0.46.30
Albana 81.40.45.50
Barchia 77.0.44.40
Baruca 79.20,44.40

Armenia the greater.

Lala 76.10,44.0,
Bizjaca 74.50.45.30
Babila 73.15.40.45
Anarium 76.50.41.30
Belcania 73.50.39.40.

Of Syria, the Cities.

Alexandria 69.30.36.10
Selutia 67.30.32.50
Laodicia Ramatha. 88. 30.35.3.
Posidium 88.30.35.15
Pyziandzus Alaplo 69. 30.35.50.

Phœnicia.

Tripolis 67.30.34.20
Biblus 67.40.33.55
Sidon 67.30.33.30
Tyrus 67.5.33.18
Soz, commonlie called Sur, a Citie after the ruine of Alexander Christened: now destroied of the Turke, of the two Cities Sidon and Tyrus, Christ our Sauiour in his Gospell speaketh.
Ptholomais, Acon. 66.50 33.0.
Berytus, but of our trauellers now called Barut, it is the Port of Damascus. 67.0.33.20
Botrys, Botrus. 67.50. 34.5.
Doza 66.30.32.40
Antiochianie the mount Taurus of the countrie of S. Luke Euangelist 69. 0.35.30.
Leonia 70.30.36 20

Of

The two firſt numbers ſhew the Longitude with his minuts. The two ſecond ſhew the Latitude and his minutes.

Of Curua, the Cities.

Abila Lyſanium 68.45. 33. 20.
Damaſcus, héer did Caine ſlaie his brother Abell. 69. 0.33.0.
Adra 68. 40.32.10
Hippus Scephet 68. 0. 32. 30.
Capitolia Suueta 69. 45 32.30.
Philadelphia 68.0.31.20

Laodicina.

Paradiſſus 69.45.33.35.

Iudea or Paleſtina.

Ioppa, Joppen, or Jaffa, a Port which was builded before the Diluge, 65. 45.31.55.
Aſcalon Hibelis, commonlie called Eſcolona. 65.0. 31. 40.
The dead ſeas or Lake of Sodome. 66.50.31.10

Of Galilæa.

Julias, or Bethſaida, the countrie of Peter and S. Andrew. 67.5.31.15.

Of Samaria.

Neapolis Sichen, héere did Chriſt conuert the Samaritane. 66.50.31.50

Iuda.

Gaza 65.25.13.15
Sebaſta Samaria 65. 40.31.30.
Lydda Rama 66.0.32.0
Ericus Jerico 66.15.31.25
Nicopolis ſometime called Emaus, héere was Chriſt knowne by breaking of bread. 65,45.31.50
Jeruſalem which is now called Capitola, and haue diuerſe other names: héere was our Sauiour Chriſt crucified, and paid the ranſome for our ſinnes in the beginning of the foure and thirtith yeare of his bodilie age. 65.45.31.22.

The two first numbers shew the Longitudes with his minuts. The two second shew the Latitude and his minutes.

Idumæa.

Berzmma 64.50.31.15
Baps Balla. 65.40.30.50

Mesopotamia.

Borsica 72.0.37.30
Holeucia Bolell. 79.0. 35.40.
Edelle Rase 72.30.37.30
Zama 75.20.36.30
Carre, Charan, héere did the holie Patriarch Abzaham dwell. 73 45.36.10
Babilon Baldache, the chéef bishops sea in Chadea héere (Building the Tower Babell) sprang the confusion of tonges. 79.0. 35.0.
Bilba 79.0.35.0
Cesa 76.40.32.50
Thelma 77.40.32.0
Dzcho 78.30.32.40

Arabia, which is parted in three parts, *Arabia deserta, Petrea*, and *Felix*.

Crupa. 72.30.30.15
Boza. 75.0.30.26
Choca 72.3.32.40
Balma 78.20.29.20
Lysa 65.50.30.15
Petra 66.45.30.20
Lydia 69.0.30.40
The Red Seas through which Moyses and the Israelits went. 63.30.29.50
Mount Sinaye, which is also called the mount Oreb, or Chozeb. Héere receiued Moises the ten commandements. 64.0.30.0
Thebe 69.40.21.0
Muza 74.30.14.0
Sanina 75.30.11.30
Arabia Aden 80.0.11.30
Bolcha 88.30.14.0
Cabana 85.0.23.0
Istriona 80.25.25.40
Badea Gydda 70.0.20.15
Mecha, héere is the Sepulcher of Mahomet, which the Turkes goe to visit with great deuotion, and yet strangers comming thether sée no other thing then a golden shoe hanging in the rooffe of the Temple. 72.15.23.0
Saba, the seate of Gaspar the King, which brought Golde of Arabia to offer vnto

The two first numbers shew the Longitude with his minute. The two second shew the Latitude and his minutes.

vnto Jesus being a childe. 76.0.13.0.

Asiria.

Ninus, Niniue, a great citie, but now desolate, vnto which Jonas the prophet was sent. 78.0 36. 0.

Ctesiphon.	80.0.35.0
Arbila.	80.0.37.15

Media.

Talaca	86.15.41.0
Vandagara	87.45.39.30
Echatana	88.0.37.45
Veneca	93.20.38.15
Gariauna	51.0.37.20
Trauara	92.0.37.40
Agra	80.30.33.45

Susana.

Susa a Cittie.	80.10.31.40
Susa Hambragata.	84. 0.34.15.
Tariana	84.0.32.30
Agra	80.30.33.45

Persia.

Arima	87.45.33.50
Persipolis	90.0.33.10
Diodorus	91.0.33.20
Aserga	90.15.34.0
Tragonica	87.40.32.40
Vassara	81.20.29.50

Carmania.

Agris	96.30.23.0
Germaria	100.0.29.0
Thalpis	98.0.27.40
Armusa	94.30.23.30

Parthia.

Hecatompylon, a Cittie which hath an hundred gates.	96.20.37.50
Rhoara	98.30.38.20
Ambrodar	94 30.38.20
Ragea	98.20.34.20
Appha	98.0.35.20

Hircania.

Hercana	98.30.40.0

Adrapla

The two first numbers shew the Longitudes with his minuts. The two second shew the Latitude and his minutes.

Adrapsa 98.30.41.40
Saca 94.15.39.30

Margiana.

Sena. 102.30.42.20
Jasonium. 103.30.41.30
Antiochia Margiana. 106. 0.41.40.
Nigea. 105.0.41.10

Bactriana.

Thomara 106.30.24.40
Menapia 113.0.41.20
Bactra 116.0.41.0

Sogdiana.

Drepsa 130.0.45.0
Alexandria Oriana 113.0 44.40.
Scythia within the mount Emaus.
The kingdome of Chatay is vnder the great Cham, King of the Tartarians, the cheefe Cities are
Illedon Scithica. 150.0. 48.30.
Soeta. 145.0.35.20

Serica.

Illedon Serica. 162. 0.48.30.
Sera. 177.15.38.35
Dama 156.0.51.40
In this countrie breed the wormes which make silke, we call them in English Silke wormes, of which at this daye the Spaniards haue great plentie.

Aria and Ariana.

The middest of it. 106. 0.35.30.
Namaris. 105.40.36.10
Articaudua. 106.20.36.0
Alexandria. 110.0.36.0

Drangiana.

Alla 107.30.36.0
Bigis 111.0.29.20
Agriapsa 108.0.34.0

Gegrosia.

Guni 110.0.23.50.

Parsis

The two first numbers shew the Longitude with his minuts. The two second, shew the Latitude and his minutes.

Parsis. 106.30.23.30
Arbis 105.20.20.30.

India within the Riuer Ganges.

Barbarima. 213.40.20.40
Monoglossum. 114.10.18.20
Mandagara. 115.10.14,20
Colchi now called Crichina, vnto which the Lucitanians are very frendlie. 123.0.15.0
Salur 125.0,15.0
Bizantium. 113,40.14.40.
Tyndis. 138,30.16.10
Caticutium. Calecht. The moste famous Cittie of Merchandise in all India, they haue a proper King of their owne: but the Crowne comes not by succession vnto their Childrē, for this cause; for they haue this vse, that when any man marieth, he must committe his wife to the Priest to be deflowred. Vnto this Citty, is brought from all India, all kinde of spice, Cloues, Nutmegs, Ginger, Cinamon, Rubarbe, Muske, Saunders, Aloes, Cassia, Also precious stones of diuers kinds and all manner of Silkes. There are diuers sortes of inhabitants in this Cittie: Christians, Turkes, Mahomets, Caffranans, Idolaters. And this last kind do often (as it were in token of frendshippe) lende their Wiues one to an other. 112.0.5.0
Similla. 110.0.14.45
Hippocura. 120.30.4.0
Caticardama. Cozimandel. 136.20,12,40
Sambolaca. 132,15.31.50

Prasia.

Palibotra. 143.0.27.0
Tamalitis. 144.30.16,30
Sambalaca. 141.0.29.30

Countries & Cities without Ganges in India.

Pantaplis 150.0,18.0
Baracura Bangella. 152 30,16.0.

The two first numbers shewe the Longitude with his minuts. The two second shew the Latitude and his minutes.

Sabara 159.0.8.30
Begynga. 162.20.8.26
Tacola 150.30.40.15
Sabana 160.0.3.0
Coliplis 164.20.0.0
Balonga 167.30.7.0
Synda 167.15.30 40
Tagoza 168.0.6.0
Eldana, bether came saint Thomas to preache the Gospell. 152.0.13.0
Trygliphon 154.0.17.0
Gozgatha 167.0.12.30

Chatay, a region.

Chataio 222.0.43.50
West Ciamfu 222.0.37
Quinsay, the greatest citie in all the earth, and is as much to say with vs, as the heauenlie citie, in the middest of it is a Lake, which in the circuite haue 1200 bridges. 226.0.37.40
Geiten 259.0.25.15
East Ciamfu 231.0.32.5.17
Focho 240.55.7.0
Mingrei. 236.0.35.0

Mangi, this conteineth in it nine kingdomes.

Taygin 224.15.31.0
Sygni 232.0.29.20
Thebet, a prouince in which the great Cham, Lord of the East and south Indians hath his seat, and all the kings of Indians haue his seat, and all the kings of India are vnder him. 204.10.3.20

Cyamba.

Cyamba. 208.10.25.30
These vse Tozall in the sted of money, they haue great plentie of Nutmegs, Aloes & all kind of spices.

South India.

The inhabitants are all Idolaters, and haue these kingdoms following.

Lamia 202.10.11.40
Mozfuli 285.0.13.0
Chime. 180.0. Southpole 3.10.

Moabar.

Mar, the inhabitants do worship Oxen. 276.0.
Southpole. 20.10
Malaqua, heere was saint Thomas slaine. 260.6
Southpole. 15.30

The kingdome of Lac.

Lac, a Cittie, the inhabitants

The two first numbers shew the Longitude with his minuts. The two second, shew the Latitude and his minutes.

tants worship Dren, and are great Idolaters, yet iust in their affaires, and haters of lies and liers, 166.30.21.40.

Of the Ilands adiacent to Asia and India, and new regions of this third part latelie found out.

Cyprus.

It is an Iland in the middle earth Seas, in which Japhat, one of Noe his sonnes first inhabited, 65. 30.35.10.

Scotora in Arabia the happie, now it is called Scoyra. 86.20.12.0

Ormusa is an Iland in the narrow Perstick seas, 96.20.19.0.

Tabrobana.

It is also named Samotra it is a great Iland, 151.15. It is without Latitude, because it is vnder the equinoctiall.

Coo.

Coo an Iland, in which the prince of Phylitians Hypocrat. was borne. 57.0. 36.25.

The Greater Iana.

Iana. 179. 0. The Southpole. 7.30.

Borno.

Borno an Iland. 1780.0 the South Pole. 2,30

The lesser Iana

Iana. 188.9. vnder the Equinoctiall.

Ambicon.

Ambicon, 166. 0, The South. Pole. 7.0

Gelilo.

Gelilo, also Solor, one of the greatest Ilandes of Moluck. 204. The South Pole. 1. 0.

Ilands of Moluck.

The other Ilands are vnder, 193. 0. 9. 0. degrees.

The two first numbers shewe the Longitude with his minuts. The two second shew the Latitude and his minutes.

Iucatan.		of Cancer.	
Iucatan.	257.30.19.0	Iamaica.	
Cuba.		Iamaica.	270.0.19.30
Cuba	269.30.23.30	Vasandrea.	
It is vnder the Tropicke		Vasandrea.	331.3.40.0

Thus endeth the perticuler description of Asia.

A PARTICVLER

description of some parte of *America*, as by trauaile is found out.

AMerica which is named the fourth part of the earth, and was to Ptolomeus, and the auncient Cographers vnknowen: as also at this present, great parte of it is not yet found out, it taketh the name of America of Americus Vesputius, who by the commaundement of Ferdinando King of Castell, found it out, in the yéere of Christ our Sautour. 1497. about the ende of June, as doth appeare by his owne testimonie. The people both men, and women are naked, neither suffer they any haire to growe on theyr bodies, no not on theyr browes, the head except, they are excellent in swimming, both men and women, so that they without wearines can swimme two Leagues. Their weapons are bowes and arrowes, which they prepare, and heade with stones, and the téeth of Fishe, for that they wante Iron, and all mettaile (Gold except.) They haue warre with the inhabitauntes of the Countrey next them, which haue an other language. But it is not for ritches, for inlarging theyr signorie, or election of a King: but for to reuenge the deathes of their predecessors. There is no lawe or order obserued of wedlocke,

for

for it is lawefull to haue so many women as they affect, and to put them away without any daunger. They be filthy at meate, and in all secrete actes of nature, comparable to brute beastes. Their bread is rootes, and their meate mans flesh, for all theyr enemies, which they ouercome, they with great banqueting deuour. Their houses are builded like the shape of Belles, and couered with Leaues and Palmes of trees, they vse no kinde of Marchandise, and as for Golde, Pearle, Stone and that we haue in great prise, they haue in no estimation. For theyr ritches is in feathers of diuers colours and stones, which they hange on theyr eares and lippes for an ornature. They dw honour the Sunne, Moone and Starres, there is also in the West part of America, a region called Peru, most ritch of all other that hether to haue bene found, bothe of mettailes and precious Drugges. Their shepe be of such fertilitie, that they twise yerelie haue Lambe. The inhabitantes are ciuil, wise, prudent, skilfull of Marchandise. But yet they know not Christ, the middes of America is in degrees, 330.0. The pole Antartick, 10.0. The breadth of it is, 2100, English miles, the length 3000, miles. There are diuers and sundrye Ilandes about America, in our dayes founde out of which hereafter shall followe the principall.

¶ Peru with the shoare towarde Spaine.

Peru. 290. 5. 0. South pole

Caput de Stado. 317. 0 2. 30.

Archay Chersonesus. 303 0. 5. 0.

Sinus aquæ dulcis, here are seauen Ilandes founde, in which are great plentie of pearles and precious stones 322. 0. South pole. 4. 30.

Riogrande. 329. 0. South pole. 4. 30

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S. Rochi. 341. 0. South pole. 8. 15.
Caput S. Crucis, heere Magelanus found a Giant 9. foot in length. 345.0.14.0
Rio. S. Iacobi. 356.0.23.30
Rio de S. Lucia. 341.0.27.20

Ilands adioyning to America.

Riqua ỹ lesser. 296.0.10.0
Riqua the greater. 300. 0.9.0
The Ilande of Giants. 308, 7.5.0
The Iland of Brasill. 305,4.6.10.
Laponto. 318.30.4.0.
Spagnallo, heere is founde Guaicum that healeth the Neapolitant sickenes. And the middes of the Ilande containe. 305.0.23.0

Ilands toward Affrica are innumerable. Of which, these are found out.

Todosanctos. 332,30.17.0
Desezana. 323.0.18.0
Degadalupo. 331.10.15.30
The greene Iland. 347 0. 14. 0

A perticuler Table of the Latitudes of the chiefest places in Spaine, and of the Indies.

	Pole. Degrees.		Pole. Degrees.
Alcala d' Henar.	40	Cabo de finis terræ.	43
Alcala la real	37	Caceres	40
Alcantar	39	Cadiz	36
Alicante	38	Calahorra	42
Almeria.	37	Calatraua	39
Alunnecar	37	Camora	41
Asторga	42	Caragoca	42
Auiles	43	Cardono	41
Baco	37	Carmona	37
Barcelora	40	Cartagena	38
Belezmalaga	37	Ciguenca.	41
Bilbao	43	Ciudad real	39
Braganca	42	Ciudad rodrigo	40
Burgos	42	Conubra	40
Cabo de S. Vicente.	37	Cordoua	38

Coria,

	Pole. Degrees		Pole. Degrees
Coria	40	Murcia.	37
Corunna	43	Naiara	42
Cuenca.	40	Oporto	41
Denia.	38	Orense	42
Durango	43	Orihuela	37
Ellerena.	38	Oviedo	43
Empurias	41	Palencia	42
Euora	39	Pamplona	43
Ecija	77	Perpinnan.	42
Euente rabia	43	Plasentia	40
Gandia	38	Ponferada	42
Gibraltar	36	Ronda	36
Girona	41	Rosas	41
Granada	37	Salamanca	41
Guada laiara	41	Santiago	43
Guadalupe	39	Sanlucar.	37
Guadix,	37	Santander	43
Laredo	43	Santaren	39
Leon	42	Sanuic dela barq.	43
Lerida	41	Segouia	41
Lisbona	39	Seuilla	37
Logronno	42	Simancas	41
Lora	37	Soria	42
Lucena	37	Tarifa	36
Lugo.	43	Tarragona	40
Madrid.	40	Tauila	37
Malaga	37	Toro	41
Mallorca	39	Toledo	40
Marbella.	36	Trugillo.	39
Medina de rio seco	42	Tudela de nauar.	42.
Medina del campo	41	Tui	42
Medina celi.	41	Valencia	39
Merca	39	Valladolid	42
Meranda de Ebro	43	Ubeda	38

	Pole. Degrees.
Vermeo.	43
Villena.	38
Xatiua	38
Xerez de la front	37
Xerez de badaioz.	38,
Ilands de Canari.	
Canaria	28
Fuert Uentura	28
Comera	28
Hierro.	28
Lancarote	29
Madera	33
Palma	29
Puerto ſancto	33
Tenerife	28
Ilands de Barlouento.	
Bahama	27
Cubagua	11
Delleada	15
Guadalupe	15
Hauana	23
Iamaica	18
Margarita	11
Matancas	23
Puerto rico	18
Puerto de plata.	20
Santo Domingo	18
Pueblos de tierra Firme.	
Cabo la Uela	12
Cartagena.	10
Coquibacoa.	12
Cabo grans a Dios.	15
Cabo de Hondur	16
Cocumel	19
Maracapna.	9
Nombre de Dios	10
Puert d' cauallos	15
Santa Marta	11
Ueragua	10
Uenecuela	8
Pueblos de Nueua Eſpanua.	
Cacatula.	18
Chiametla	20
Colima	18
Granada,	10
Guatimala.	15
Guaraca.	22
Gua Zacoaleo	17
Leon	10
Merico	20
Mechoacan.	17
Nicaragua.	9
Panuco	23
Realeio	13.
Tecoantepec.	16
Tlaſcala	20
Ueracruz	18
Xaliſco	22
Pueblos de la mar del Sur y del piria.	
Arequipa.	16
Atuncolla	14

Ayagmire

	Pole. Degrées.		Pole. Degrées.
Ayaguire	15	Puertonicio	1
Bogota.	2	Popayan.	3
Charcus, o ciudad.		Potosi	20
De a plata	20	Quito.	0
Choquiao	17	S. Juan de Ancer. n.	4
Caly	4	Santiag del Stero	28
Chaparra	3	San Juan	4
Cuzco.	14	San Miguel.	5
Chucuito	19	Trugillo	8
Guamamanga	13	Tarira	22
Guamaca	24	Timana	2
Lima.	12	Tumebamba	2
Nasca.	15	Villaviciosa	1
Panama	9	Zamora	12

The names of the thirtie and two poyntes in the Ship Compasse, which be the Wynds names, the Mariners sayle by.

Nozth	East, noztheast
South	East and by nozth
Easte.	East and by South
west	East southeast
west and by Nozth	Southeast and by easte
west Nozthwest.	Southeaste
Nozthwest and by west	Southeast and by south,
Nozthwest	South southeast
Nozthwest and by nozth	South and by easte
Nozth nozthwest	South and by west
Nozth and by west	South southwest
Nozth and by East.	Southwest and by South
Nozth noztheast	South weste
Nozthest and by nozth	Southweste and by west,
Nozthest	Weste, southweste
Nozthest and by easte	Weste and by South

NOw you dw vnderstand the thirtie two poyntes in the Ship Compasse: it is also necessarie to knowe and vnderstand, how many minutes a poynte containeth. The poynt containeth foztie fiue minutes, that is thzée quarters of howr an, and thirtie and two times foztie fiue minutes, maketh a thousand fowze hũ-

dreth and fortie minutes, which being reduced in two howers, giuing threescore minutes to an howre, yeldeth 24. howers, the whole circumference of the compasse. And to shift the Sunne and the Moone by the poyntes of the Compasse, it were necessarie for you to deuide the compasse into thirtie euen poyntes in this wise, deuide the two odde poyntes into thirtie partes giuing to euery poynte three minutes of an howre, (for so it falleth out in the distribution.) for the two poyntes in the compasse yeldeth fourescore and tenne minutes, to be deuided in thirtie partes, then doth euery poynte in your compasse, containe fortie eight minutes of an howre. Now to worke by your compasse to shifte the Sunne and Moone, I will set downe vnto younge scholers desirous of skill, a verie easie & playne way, marke well when the moone changeth, the which is found out by the Epact, and when she is an houre olde, she is two minutes behinde the Sunne, so that in 24. houres the moone is 48. minutes of the Sunne, and that is the 30. parte or poynte of your compasse and because that ther is 15. dayes from the change to the full, if ye multiply 48. minutes by 15. it yeldeth 720. minutes, which being reduced into houres by 60. minutes it maketh 12. houres and that is the opposition or full of the moone, and thus counte againe from the ful to the change, for as soone as it is an houre after the full, the moone gathereth two minutes nerer the Sunne and so euery houre increasing two minutes, till she commeth to the coniunction of the Sunne, and so change againe and is called a newe moone.

An other prettie rule or two, to be applyed of the mariner or Saylor worth the noting.

OF the Prime, the common rule is, that Sunday Prime is drie weather, Munday prime wet, Tuesday Prime colde & windie, Wednesday Prime tempestious, Thursday fayre and cleere, Friday chaungeable, Saterday raine, the three dayes from the change, is the Prime day, &c.

Beda

Beda ſayth if the Sunne be ſpecled, or hid vnder a cloude, betokeneth a rayne day, if he be red and pale, it betokeneth a day of tempeſt, and if he ſéemeth hoariſhe in the middle, ſo that he ſhine in the middle, and ſende out beames towardes the ſouth, betokeneth tempeſt, moyſt and windie: if he be pale, and falleth among black clowdes, betokeneth northerly winde.

An other rule of the Moone.

MArcianus ſaith the Moone ſignifieth and betokeneth changing of times, for (as Beda ſaith) if the Moone be all redde as Golde in the beginning, then ſhe betokeneth windes. And if there be blacke ſpottes in the ouer corner and wemmes ſhe betokeneth raine in the begining of the month, if ſhe be red in the middle, it betokeneth fayre weather and cleane in the full mone, and in the night rowing, if the Mones light ſparckleth on the oares, then tempeſt ſhal come in ſhort time, alſo the Mone changeth figure and ſhape: for ſhe ſheweth towarde the earth a diuers face of her light: for now ſhe ſheweth her ſelfe ſhaped bowe wiſe, now is a circle and round to ſight of men. Now Moynoydus, nowe Dictotomos, now Amplutricos, now Pancilenos and he is Moynoydos, when he is new and ſéemeth horned: and is Dictotomos, when he is as it were halfe full, and is eight dayes olde, and he is Amphitricos, when it is doubted of his full roundnes, when he is eleuen or twelue dayes olde, and he is Panſilenos when he ſhineth at full when he is foureténe dayes olde, alſo the Mone ſheweth her ſelfe in three ſtates: For he is with the Sunne in coniunction, when he is next to the Sun or a ſide, when he paſſeth forward the Sunne, or when he is all afore the Sunne, when he goeth firſt forward, the Sunne he ſéemeth with hornes as a bowe, and then alway the hornes be turned Eaſt ward: and when he commeth againe to the coniunction, he receiueth the ſame figure and ſhape, and then the hornes be alway turned Weſt warde, and in that ſide that is turned fromwarde the Sunne, he ſéemeth alway boyd, and the ſide toward the Sunne full of light.

A Particuler Table of the moueable feasts, seruing for 44. yeeres, according to the new reformed order in forraine Nations, necessary for all persons, which trauaile or haue any trafficke in those partes.

	The yeere of our lord.	The Sunday Letter.	Epact.	Septuagesima,	Ashe Wednesday.	Easter day.	Rogation, Sunday,
	1587	D	21	25. Janu.	11. Febru	29. Mar.	3. May.
B	1588	C B	2	14. Feb.	2. Marc.	17. Aprill.	22. May.
	1589	A	13	29. Janu.	15. Feb.	2. Aprill.	7. May.
	1590	G	24	18. Feb.	7. Marc.	22. Aprill.	27. May.
	1591	F	5	10. Feb.	27. Febru	14. April.	19. May.
B	1592	E D	16	26. Janu.	12. Febru.	29. Mar.	3. May.
	1593	C	27	14. Feb.	3. Marc.	18. Aprill.	23. May.
	1594	B	8	6. Febru.	23. Febru.	10. Aprill.	15. May.
	1595	A	19	22. Janu.	8. Febru.	26. Mar.	30. April.
B	1596	G F	1	11. Febru.	28. Febru.	14. April.	19. May.
	1597	E	12	2. Febru.	18. Febru.	6. Aprill.	11. May.
	1698	D	23	28. Janu	4. Febru.	22. Mar.	26. April.
	1599	C	4	7. Febru.	24. Febru	11. Aprill.	16. May.
B	1600	B A	15	30. Janu.	16. Febru.	2. Aprill.	7. May.
	1601	G	26	18. Febru.	7. Marc.	22. Aprill.	27. May.
	1602	F	7	3. Feb.	20. Febru.	7. Aprill.	12. May.
	1603	E	18	16. Janu.	12. Febru.	30. Mar.	4. May.
B	1604	D C	29	15. Feb.	3. March.	18. Aprill.	23. May.
	1605	B	10	16. Febru.	23. Febru.	10. April.	15. May.
	1606	A	21	22. Janu.	8. Febru.	26. Mar.	30. April.

A Particuler Table of the mooueable feastes in Forraine Nations.

Ascention day.	Whit sunday.	Trinitie Sunday.	Corpus christi. day.	Aduent Sunday.
7. May.	17. May.	24. May.	28. May.	29. Noue
26. May.	5. June.	12. June.	16. June.	27. Nou.
11. May.	21. May.	28. May.	1. June.	3. Decēb.
31. May.	10. May.	17. June.	21. June.	2. Decem
23. May.	2. June.	9. June.	13. June.	1. Decem.
7. May.	17. May.	24. May.	28. May.	29. Nou.
27. May.	6. June.	13. June.	17. June.	28. Nou.
19. May.	29. May.	5. June.	9. June.	27. Nou.
4. May.	14. May.	21. May	25. May	3. Decem.
23, May.	2, June.	9. June.	13. June.	1. Decem.
15. May.	25. May.	1. June	5. June.	30. Nou.
30. Aprill.	10. May.	17. May	21. May.	29. Nou
20. May.	30. May.	6. June.	10, June	28. Nou.
11. May.	21. May,	28. May.	1. June.	3. Decē.
31. May.	10. June.	17. June.	21. June.	2. Decem.
16. May.	26. May.	2. June	6. June.	1 Decem.
8. May.	18. May.	25. May.	29. May.	30. Nou.
27. May.	6. June.	13. June.	17, June.	28. Nou.
19. May.	29. May.	5. June.	9. June.	27. Nou.
4. May.	14. May.	21. May.	25, May.	3. Decem.

A perticular Table of the Mooueable Feastes in forraine Nations.

	The yeere of our lord.	The Sunday Letter.	Epact.	Septuagesima,	Ashe Wednesday.	Easter day.	Rogation, Sunday,
	1607	G	2	11. Febr.	28. Febru	15. Aprill.	20. May.
B	1608	F E	13	3. Febr.	20. Febr.	16. Aprill.	11. May.
	1609	D	24	15. Febr.	4. Marc.	19. Aprill.	24. May.
	1610	C	5	7. Febr.	24. Febru	11. Apru.	16. May.
	1611	B	16	30. Janu.	16. Febru.	3. Aprill.	8. May.
B	1612	A G	27	19. Febru.	7. Marc.	22. Aprill.	27. May.
	1613	F	8	3. Febru.	20. Febru	7. Apru.	12. May.
	1614	E	19	26. Janu.	12. Febru.	30. Mar.	4. May.
	1615	D	1	15. Febru.	4. Marc.	9. Aprill.	24. May.
B	1616	C B	12	31. Janu.	17. Febru.	3. Aprill.	8. May.
	1617	A	23	22. Janu.	8. Febru.	26. Mar.	30. April.
	1618	G	4	11. Febru.	28. Febru.	15. Aprill.	20. May.
	1619	F	15	27. Janu	13. Febru.	31. Mar.	5. May.
B	1620	E D	26	16. Febr.	4. Marc.	19. Aprill.	24. May.
	1621	C	7	7. Febru.	24. Febru.	11. Aprill.	16. May.
	1622	B	18	32. Janu.	9. Febru.	27. Mar.	1. May.
	1623	A	29	12. Febr.	1. March.	16. Aprill.	21. May.
B	1624	G F	10	28. Janu.	14. Febru.	31. Mar.	5. May.
	1625	E	21	26. Janu.	12. Febru.	30. Mar.	4. May.
	1626	D	2	8. Febru.	25. Febru.	12. Aprill.	17. May.
	1627	C	13	31. Janu.	17. Febr.	4. Aprill	9. May.
B	1628	B A	24	26. Febr.	8. Marc	23. Aprill.	28. May
	1629	G	5	11. Febru.	28. Febr.	15. Aprill.	20. May.
	1630	F	16	27. Janu.	13. Febr.	31. Marc.	5. May

A Particuler Table of the mooueable feastes in Forraine Nations.

Ascention day.	Whit sunday.	Trinitie Sunday.	Corpus christi. day.	Aduent Sunday.
24. May.	3. June.	10. June.	14. June.	2. Decem.
15. May.	25. May.	1. June.	5. June.	30. Nou
28. May.	7. June.	14. June.	18. June.	29. Nouẽ
20. May.	30. May.	6. June.	10. June.	28. Nou
12. May.	22. May.	29. May.	2. June.	27. Nou.
31. May.	10. June.	17. June.	21. June.	2. Decẽb.
16. May.	26. May.	2. June.	6. June.	1. Decem.
8. May.	18. May.	25. May.	29. May.	30. Nou.
28. May.	7. June.	14. June.	18. June.	29. Nou.
12, May.	22, May.	29. May.	2. June.	27. Nou.
4. May.	14. May.	21. May.	25. May.	3. Decem.
24. May.	3. June.	10. June.	14. June.	2. Decem
9. May.	19. May.	26. May.	30, May.	1. Decem.
28. May.	7. June.	14. June.	18. June.	29. Nou
20. May.	30. May.	6. June.	10. June.	28. Nou.
5. May.	15. May.	22. May.	26. May.	27. Nou.
25. May.	4. June.	11. June.	15. June.	3. Decẽ.
9. May.	19. May.	26. May.	30, May.	1. Decem.
8. May.	18. May.	25. May.	29. May.	30. Nou.
21. May.	31. May.	7. June.	11, June.	29. Nou.
13, May.	23. May.	30, May.	3. June.	28. Decẽ.
1. June.	11. June.	18. June.	22. June.	3. Decem.
24. May	3. June.	10. June.	14. June.	2. Decẽ.
9. May.	19. May,	16. June.	30. June.	1. Decem.

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